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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

March 3, 1951

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Published by
TELEPHONY PUBLISHING CORP.

Vol. 140, No. 9. Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION, 608 South Dearborn St., Chicago (5), Ill. 15 cents per copy (except special issues). Subscription $3.00 per year U. S. and Countries in U. S. Spanish Postal Zone; $4 Canada; $5 Other Countries. Entered as second class matter at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH
WASHINGTON EDITOR

Communications industry advisory committee meets with NPA communications division. . . . Discusses ways and means for telephone and telegraph industries to obtain scarce materials to carry out defense emergency obligations. CWA tells what should be done to save the country in these troubled times.

First NPA Committee Meeting

UNDER the auspices of the National Production Authority (U. S. Department of Commerce) the first meeting of the Domestic Communications Operating Advisory Committee was held in Washington, D. C., under the joint supervision of Deputy Glen Ireland and Gen. C. H. Arnold, head of the NPA Communications Equipment Division.

The purpose of the meeting was twofold. First, to complete the official organization and establishment of the industry advisory committee, composed of seven Independent telephone company representatives, seven Bell system representatives, and one representative of the Western Union Telegraph Co. The second purpose was to discuss the real business of the committee—how to plan ways and means for assuring the telephone and telegraph industries of necessary scarce materials to carry out operations during the defense emergency.

Industry representatives advised NPA of specific problems facing them —particularly regarding shortages of critical materials, including copper, zinc, and nickel. The industry group indicated that many of their orders for materials have not been met because of the impact of defense rated orders for these same materials.

Further use of substitutes and conservation in order to save critical materials for the most essential projects were discussed. Substitutes and conservation measures made by some companies, according to the committee, are: Reduced sizes of wire, cable, and cable coatings; substitution of synthetic rubber for natural rubber; reductions of the tin content in solder, and use of lead for zinc in some galvanized coating on hardware.

A few of the representatives recommended that they be authorized to use DO ratings on some of their orders for materials to be used in defense-connected projects. NPA officials, however, told the group the use of DO ratings is being kept to a minimum until a Controlled Materials Plan can be put in effect. NPA pointed out that all its orders contain provisions for adjustment in case of undue hardship.

Two task groups were established to carry out further studies for the committee. Specifically, the duties of the respective groups are:

(1) To consider how the forthcoming NPA order on MRO (Maintenance, Repair, and Operations) applies to the communications industry, and if necessary, make recommendations for possible future changes in the order.

(2) To submit estimated industry requirements to NPA for inclusion in the Controlled Materials Plan which is now being developed.

The foregoing by no means exhaust the major problems on the agenda of the industry advisory committee. Nothing was released officially, for example, about the rapidly mounting problem of telephone companies filling necessary connection orders or deferring "held orders" in such a way as will be equitable and proper, in the light of current operating conditions. More and more telephone companies are reporting increases in "held orders," as time passes by and as critical materials grow more critical.

Sooner or later the industry advisory committee is going to have to struggle with a limitation order such as prevailed during World War II under the old War Production Board set-up. This should set forth a schedule of essential users for telephone service according to their degrees of essentiality. But for the present, both the NPA officials and the NPA industry advisory committee decided to mark time on that one, and to devote attention to the task force assignments already mentioned.

Between the lines, those attending the committee meeting could sense the feeling of the NPA officials that overall regulations of essential industry are soon to be promulgated by the NPA. First of these is likely to be an MRO order (Maintenance, Repair, and Operations) which will define the amount of copper, aluminum, steel, etc., which companies will need from quarter to quarter or from month to month in the course of regular operation. The second will be a CMP order (Controlled Materials Plan) whereby the industry's requirements for construction and expansion will be keyed to the allocation of specific amounts of aluminum, copper, steel, and other short materials.

Over in the Interior Department, the Defense Electric Power Administration (DEPA), which has charge of material controls for electric companies, has already made notable strides in the direction of securing the necessary information from the electric utilities on how much copper, aluminum, and steel *they* will need for major construction projects. These "DEPA" forms have already been circulated to the electric utilities. Many of them have been returned and filed with DEPA, for the purpose of obtaining "procurement assistance" in getting the necessary delivery of short supplies.

Undoubtedly, the NPA Communications Division will soon work out similar forms for the telephone industry. Eventually allocations will be made for "earmarking" certain amounts of copper, aluminum, steel, etc., to fill the industry's needs. But right now, NPA is just emerging from its first stage of organizational growing pains. It is just getting squared away to tackle the basic problems of specific allocations which will come forth in the form of CMP orders. At the same time, something resembling the old "priority ratings" will come to pass—probably supplanting the present loose system of

issuing so-called DO orders for direct military work.

Already the "DO" orders have grown so numerous that companies which do not have them, have to stand in the back of the line and are in danger of being left, on essential orders and deliveries for necessary projects. In other words, we are now in a brief transitional stage, which is likely to be the eve of a general priority rating system.

CWA Tells the World

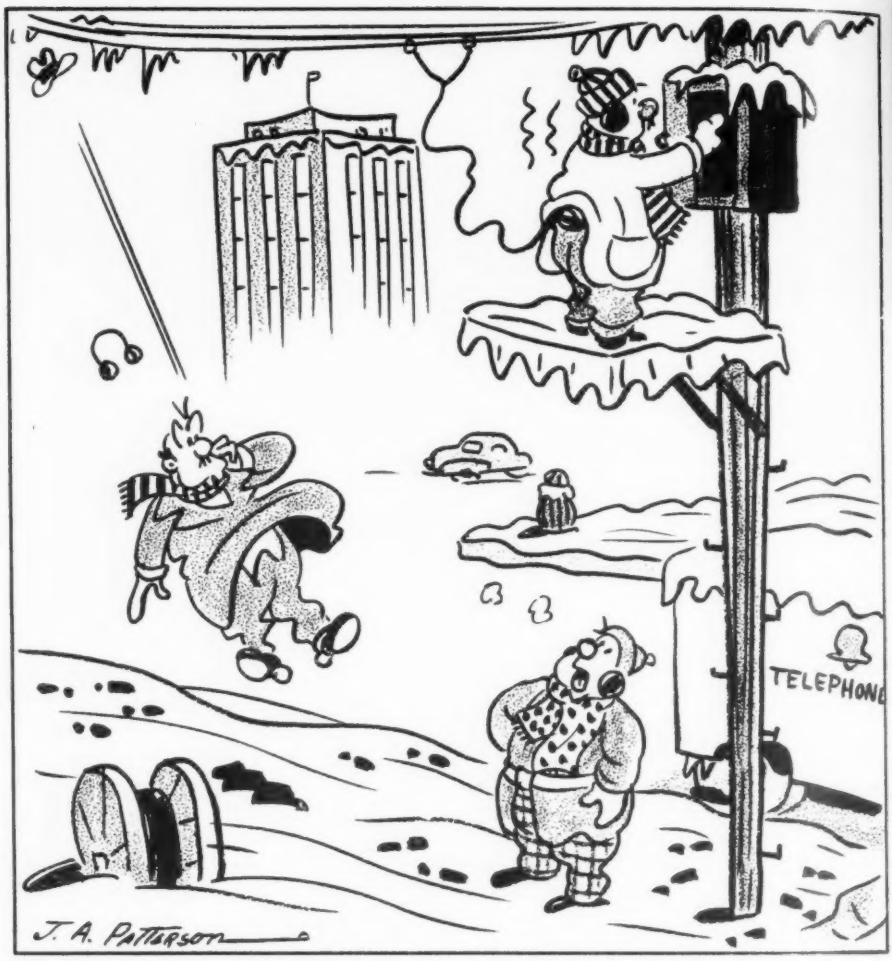
The CIO Communications Workers of America are going pretty far afield these days, in telling the country what it must do to be saved. On Feb. 16, for example, it released the contents of a 17-page "Domestic Policy" statement, which is being sent to President Truman, Labor Secretary Tobin, leaders in Congress, ODM Director Wilson, and the CIO President Murray. This takes in such broad recommendations as inflation controls, wage and price controls, manpower mobilization, rent control, taxation, profit restrictions, and the elimination of speculation.

Four days later, the same union came up with another release, proposing that the regulation of all telephone rates should be in the hands of a single federal rate-making agency. This may seem like a pretty large order for an organization which ostensibly is supposed to be dedicated to the primary functions of representing union workers in the telephone industry, with respect to wages, working conditions, and other more normal issues of collective bargaining. But it is still a free country. And if the CWA union people have discovered any real remedies for the nation's basic ills, now is no time to hide their light under a bushel. There seems no danger of that, however.

Glancing over the CWA prospectus for controlling inflation, profiteering, etc., this writer could see very little in the way of an original approach. Most of the advice seems to be straight out of some orthodox, left-wing, economic handbook. Most of it is pretty general, with more emphasis on adjectives and epitaphs than concrete suggestions.

"Profiteering," we are told, "is bad." "Power grabbing" cannot be allowed. The Defense Production Act ought to be junked in favor of a wage-price control system based on World War II. But while the elastic "price control" being practiced in Washington is condemned, and "clearly stated retail price ceilings" are demanded, the CWA statement suddenly goes mealy-mouthed in talking about wage controls.

Instead of wage control it is called "wage stabilization;" and there are vague references to the need for bringing allegedly lagging wage earning power into closer relationship with increased prices. How this can be done without starting the spiral all over again is neither noted nor analyzed. Insurance and pension plans "being non-inflationary," ought to be promoted, without control restrictions (as if they had no effect on eventual prices), the CWA said.



"IT'S AN ELECTRIC BLANKET—HE SAYS IT'S COLDER THAN A WEDGE UP THERE!!"

"Big business" comes in for the usual drubbing. How the telephone industry, for example, could be conducted in the absence of large-scale business organizations, and the question of whether labor would be treated worse instead of better if responsible large-scale business organizations were broken down, are issues which are politely ignored.

What seems to irk the CWA, as well as other labor unions, at this point, is the fact that President Truman has called upon the business experience of industrial management to take a leading role in coping with national economic problems of the current mobilization crisis. The CWA statement does not give any assurance that labor leaders would come to grips with such problems any more realistically if President Truman had made a different selection in favor of labor leaders to run the show. CWA seems to assume that businessmen (such as Charles E. Wilson, former head of General Electric) represent business rather than public interest in the national control set-up. That could be the only explanation of their demand that labor leaders, *as* labor leaders, should be given more authority in the ODM.

The balance of the statement is pretty much the same. The idea of a national sales tax is decried. But business corporation profits should be taxed higher—"more than the 85 per cent proposed by the administration" on so-called "excess profits."

CWA also wants much heavier income taxes on single persons earning above $2,000 a year or on those with three dependents earning $4,000 a year or more. The statement proposes an end to the "orgy" of commodity speculation, which is naively assumed to be the actual cause of inflation—as if the thermometer had anything to do with causing the weather. One of the controls suggested is a government corporation with monopolistic authority to

(Please turn to page 23)

ABC of the Telephone

By FRANK E. LEE

PART 54. CARRIER TELEPHONY — Section II. The preceding article in this series appeared in the Dec. 22, 1950, issue, p. 25.

A QUESTION frequently asked relative to the addition of carrier channels to a line is—what maintenance is required. Actually this question can be answered in two ways. First, if a wire line is in good working order, carrier channels can be added with little or no maintenance activity. However, a prudent answer to the question of maintenance is that a certain amount of such activity is a worthwhile investment.

Carrier equipment adds channels to a wire line. The importance of the wire line increases as the number of carrier channels increases. Thus, a carrier equipped line should be given careful maintenance attention. When a single wire circuit fails in service, only one talking circuit is out of service. If a wire line equipped with three additional carrier channels should fail, four talking circuits will be out of service.

Occasionally, the statement is made that ordinary line disturbances will not interfere with carrier channels. In most instances this is true because the various induced line hums have no effect on the higher frequency currents used in carrier transmission. While this fact may be true, good operating practice dictates that an inferior circuit should not be used in conjunction with a group of good circuits. To do so will only accentuate the deficiencies of the poorer circuit. As an example, consider two points served by a wire circuit equipped with three carrier channels. Normally, 25 per cent of the calls will be completed over the wire line. If transmission over the wire line is inferior, service complaints can be expected on 25 per cent of the calls. As a general rule, carrier channels and physical channels should talk up about the same. Striving for a higher grade of transmission efficiency will result in the best over-all service. Carrier should not be considered as a cure-all for a poor wire line. Instead, the addition of carrier channels should prove an incentive to place the wire line in the best of condition. Once this condition is attained, maintenance activity should be programmed to keep the line in good repair.

How will carrier operate over a particular line? The fact that a particular line "talks up" itself, is not proof that carrier can be added successfully. In many respects, the transmission characteristics of a line at carrier frequencies will be about the same as those found at voice transmission levels. However, before making a definite statement that carrier is or is not adaptable to a particular line, certain tests or checks should be made.

There are two ways to determine

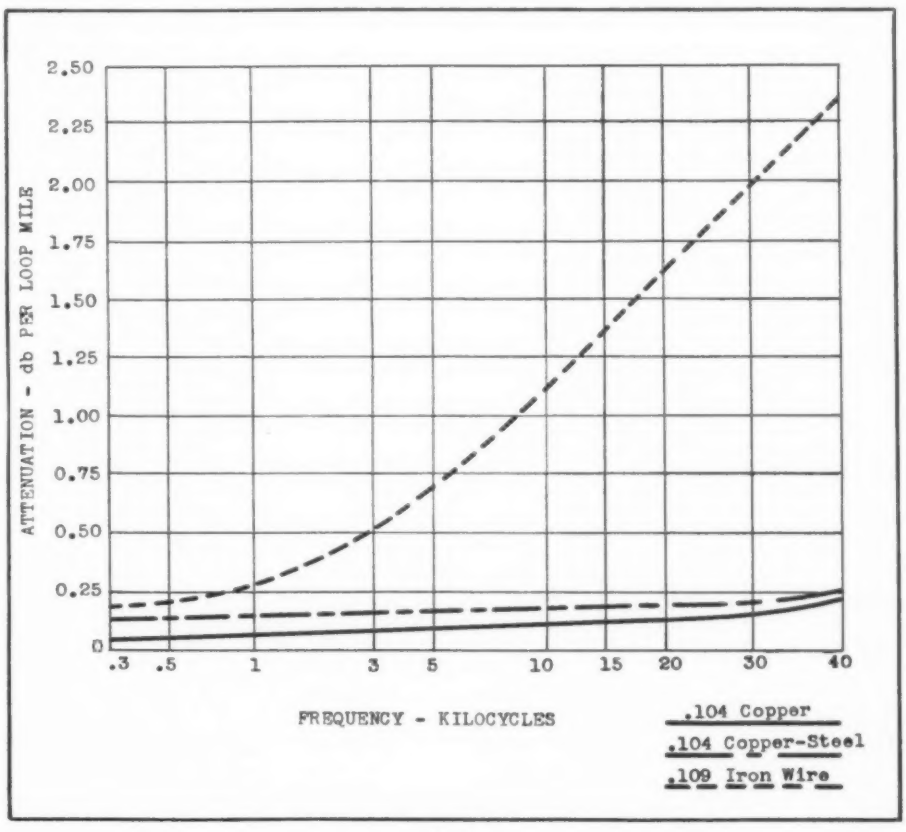


Fig. 1

how well a line will handle carrier transmission, namely:

(1) Measure the attenuation at a number of intervals throughout the carrier frequency range.

(2) Arrange for a trial installation of carrier equipment.

As a general rule, many line conditions that affect voice transmission will affect carrier frequencies in a similar manner. In some instances, the effect on carrier transmission will be greater than at voice levels. Typical items that have important bearing on carrier operation are:

(1) Type of wire.
(2) Size of wire.
(3) Length of circuit.
(4) Length and gauge of cable in circuit.
(5) Spacing and type of insulators.
(6) Transposition pattern.
(7) Impedance irregularities.

Type of Wire

The resistance of various types of material used in wire was discussed in one of the first articles of this series. Under normal wire transmission conditions the resistance, as governed by size and length of wire, was a fairly constant factor. However, in carrier transmission, the loss of attenuation varies with the frequency of the carrier channel. In this respect, four types of wire facility should be considered. These are iron, copper, copper-steel, and cable.

As shown by the chart in *Fig. 1*, the attenuation of 12-gauge iron wire increases sharply as the frequency increases. On the same basis, .104 copper and .104 copper-steel wire maintains a practically constant attenuation loss over the frequency range. The copper-steel wire considered in this graph is a copper-jacketed steel wire rated at 40 per cent conductivity of solid copper.

Very often a question is raised pertaining to the practically uniform attenuation of copper-steel and copper wire at carrier frequencies. In view of the 40 per cent conductivity of copper-steel, a correspondingly higher attenuation would be expected. However, at higher frequencies a current tends to travel along the outer cross-sectional area or "skin" of a wire. At lower frequencies the current is more evenly distributed throughout the entire cross-sectional area. As a result, a copper-steel wire, by setting up a condition similar to a copper tube, provides a conductor with characteristics similar to those found in copper wire for the transmission of high frequency currents.

A comparison of the various losses shown on the graph reveals that at 40 kilocycles the attenuation of the iron wire is about 10 times greater than either of the copper wires. At 10 kilocycles the attenuation of the iron wire is somewhat greater than four times that of the copper wires. Obviously, this fact will be of profound importance when more than one carrier channel is being considered for the iron wire.

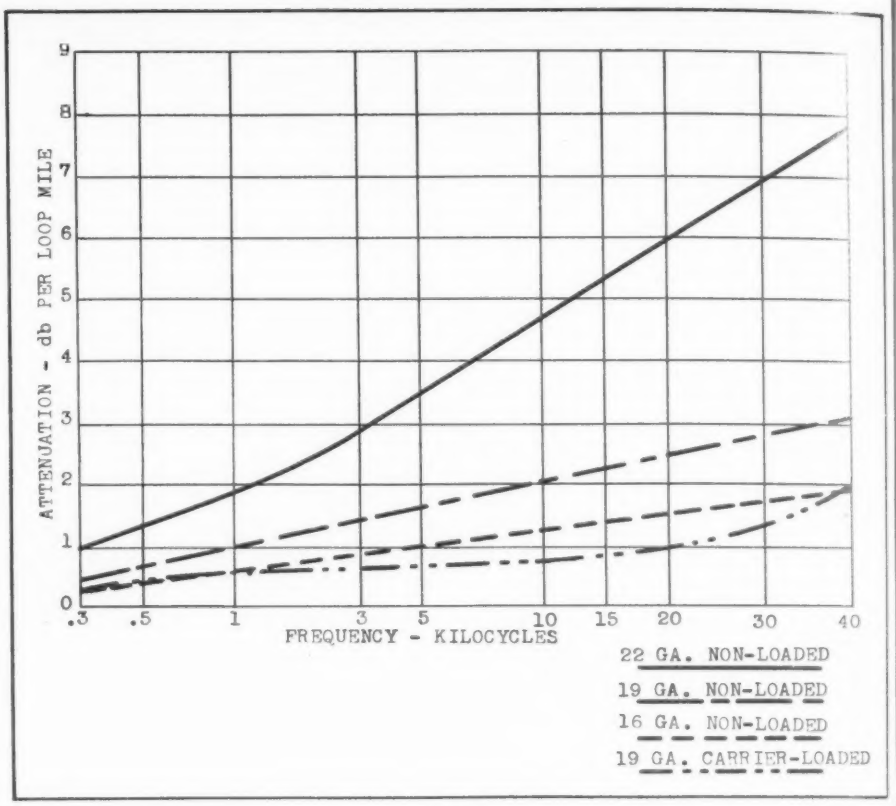


Fig. 2

As discussed previously, each carrier channel operates in a separate frequency band. As more channels are added, higher frequencies must be used. As an example, the first channel may operate in the 10-kilocycle range. The chart shows that 12-gauge iron wire would have an attenuation of 1.10 db per loop mile in this frequency range. A 20-kilocycle channel would have a 1.70 loss per loop mile over the same wire. For a 30-kilocycle channel the loss would be 2.05 db per loop mile. In many instances this variation in channel frequencies can be corrected by using the higher frequency channels on the shorter lines.

The increased attenuation of cable at carrier frequencies is shown in *Fig. 2*. An interesting point brought out by this graph is the relatively low attenuation of 16-gauge, non-loaded cable. Actually, the attenuation in 16-gauge, non-loaded cable increases by only ¾ db per loop mile between one kilocycle and 10 kilocycles.

Size of Wire

The graph shown in *Fig. 2* will serve also as an indication of the effect of wire size on attenuation at carrier frequencies. At 40 kilocycles, 16-gauge, non-loaded cable has an attenuation of just under 2 db per loop mile, while 19-gauge, non-loaded cable, half the size of 16-gauge, non-loaded has an attenuation of about 3.25 db. The decrease in size by 50 per cent resulted in approximately a 60 per cent increase in attenuation. The next step to 22-gauge, non-loaded cable, a 50 per cent decrease in size from 19-gauge, has an attenuation of approximately 7.75 db. In this instance a decrease in size by 50 per cent resulted in approximately a 140 per cent increase in attenuation.

The graph in *Fig. 3* shows the attenuation curve for .114 copper wire. A comparison of this graph should be made with *Fig. 1*. When making the comparison between *Fig. 1* and *Fig. 3*, the fact should be noted that 0.25 db. in *Fig. 1* is one vertical space, while 0.25 db in *Fig. 3* is five vertical spaces, or to the heavier horizontal graph line.

The difference in attenuation of .114 copper, when compared with .104, a 50 per cent smaller wire, is not as pronounced as between the various size cables. Similarly, small changes in attenuation will be noted as measurements are made of iron wire of larger sizes.

From the foregoing, these facts are apparent:

(1) Changes in size of wire have

relatively little effect on attenuation at carrier frequencies.

(2) Changes in size of cable pairs have a profound effect on attenuation.

Length of Circuit

Attenuation increases directly with the increase in the length of the circuit. However, the primary importance of length of the circuit is the length of the various sections that make up the circuit. Without question, an increase of three miles of cable in a circuit would increase attenuation a great deal more than would a corresponding increase in the amount of .104 copper or copper-steel wire in the same circuit.

Length and Gauge of Cable in Circuit

As mentioned in previous paragraphs, the length and gauge of cable in a circuit has a profound effect on attenuation at carrier frequencies. The effects of terminal and intermediate cables are quite variable. For this reason carrier engineers usually should be consulted if the length of cable in a circuit exceeds 500 ft. An important fact in this respect is that one mile of 19-gauge, non-loaded cable will increase attenuation 20 to 150 times as much as would a mile of .114 copper or copper-steel wire. The increase in attenuation depends upon the frequency of the carrier channel.

The increase in capacity of a cable pair as compared with an open wire line is the primary reason why the attenuation of cable is so much higher at carrier frequencies. A frequency increase will result in a lowered impedance of the condenser characteristic of a cable pair. The lowering of condenser impedance is not linearly uniform with increased frequency. Instead, the impedance of a condenser will be lowered quite rapidly through the lower range of frequencies. As frequency increases, the impedance tends more or less to level off at a value slightly above zero, as shown in *Fig. 4*. This means as the frequency of a current increases, the capacity effect of a cable pair offers increased opposition to the flow of that current from one end of the pair to the other. Thus, the attenuation of a cable pair is exceptionally high at carrier frequencies.

Spacing and Type of Insulators

The large air space between the conductors of an open wire line is the main reason for the low capacitance of these lines. In a cable the wires of a pair are very close together. As a result, the capacitance or condenser effect of the pair is high. Thus, proper spacing of open wire conductors is important to keep attenuation at a minimum at carrier frequencies. Spacings of

Fig. 5 →

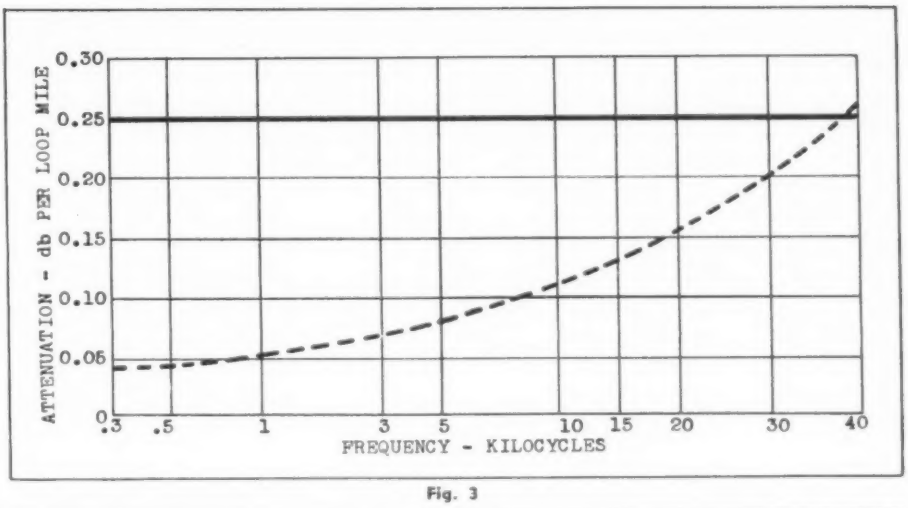


Fig. 3

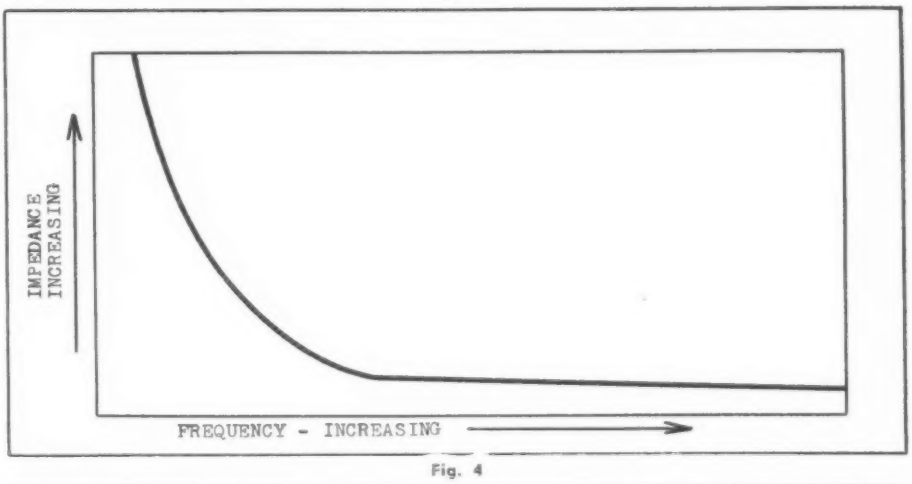
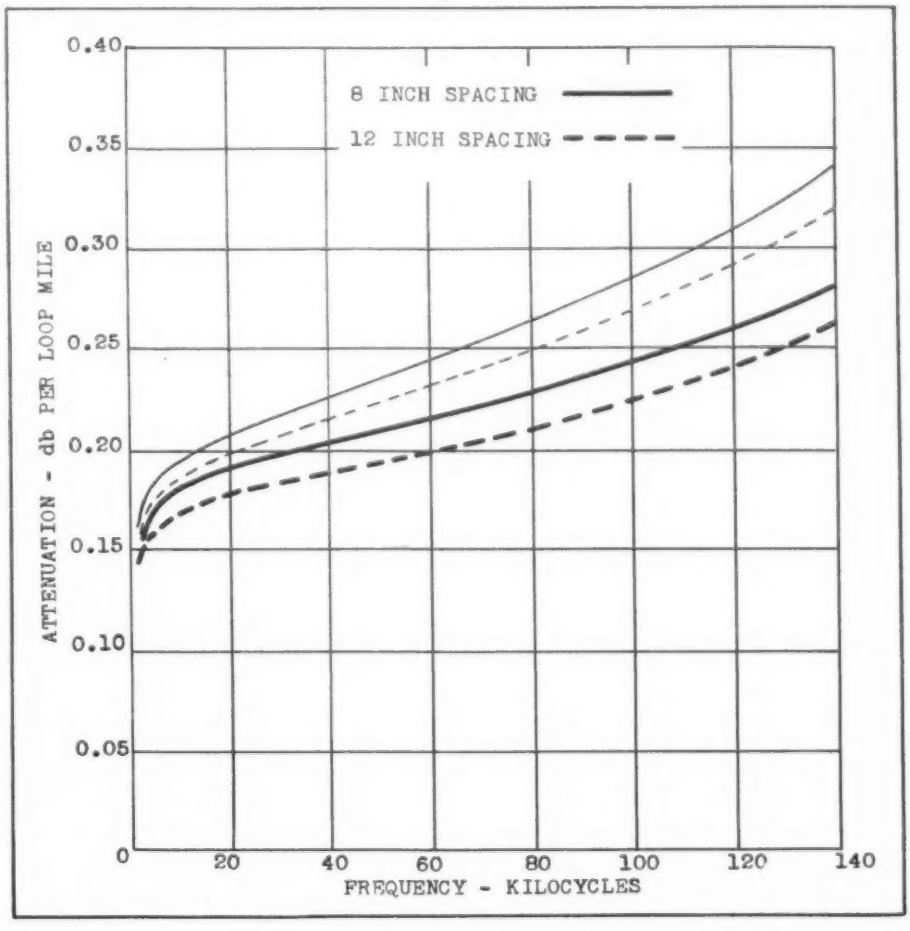


Fig. 4



eight or 12 ins. are usually considered an objective for lines to be equipped with carrier.

The variation in attenuation at carrier frequencies caused by different conductor spacing is shown in *Fig. 5*. This graph shows the attenuation in db per loop mile for .104 copper-steel wire with both eight inch and 12-in. conductor spacing. This chart is based on the use of 35 poles and 35 pairs of standard insulators per mile. Span lengths are 150 ft. The heavy lines show the attenuation during dry weather while the lighter lines indicate the attenuation during wet weather.

To make a specific comparison, at a frequency of 120 kilocycles, eight-inch spacing produces an attenuation of approximately 0.26 db per loop mile, and 12-inch spacing results in an attenuation of approximately 0.24 db per loop mile. Also, this chart serves to demonstrate the exceptionally low attenuation of this type wire at high carrier frequencies.

In addition to proper spacing, the type of insulators may affect the transmission of carrier currents. The objective is to support the line on high quality insulators. Proper design is important to insure uniform operation in wet or dry weather. Maintenance is important too. Broken insulators may introduce losses which would tend to interfere with carrier circuit operation.

Transposition Pattern

A suitable transposition pattern is necessary to the best operation of adjacent lines equipped for carrier service. Carrier frequencies usually are far above the frequency range of nearby power circuits. For this reason, practically no inductive interference is introduced into a carrier channel by power lines. However, when adjacent lines are carrier equipped, every precaution should be taken to eliminate inductive interference between these lines. One of the most effective ways of eliminating inductive interference is through a carefully planned transposition pattern. The location of transpositions on carrier equipped lines usually is planned with a definite relationship to cables and loading coils or matching transformers. Loading coils were discussed in *Part XLI* of this series. Matching transformers will be discussed further along in this group of articles on carrier transmission.

Impedance Irregularities

Still another factor that affects the over-all attenuation of a wire circuit at carrier frequencies is the loss caused by impedance irregularities or mismatches. Impedance mismatches are usually found at junctions of different wire facilities. Generally, these mismatches occur at points where cable and open wire join. Occasionally, an impedance mismatch is caused by a high resistance splice or other connection. Also, impedance irregularities are possible at termination points where the lines connect into equipment units.

The effect of impedance irregularities is to cause reflections of the carrier wave. These reflections tend to reduce the strength of the signal received at each end of the circuit. Losses of this type may vary from a fraction of a db to nine or 10 db. Usually they must be measured to obtain an accurate value.

A direct connection between a low resistance line and one with a definitely higher level of resistance creates a reflection point. As an example, consider a connection between a two-inch water pipe and a half-inch garden hose. The half-inch hose cannot possibly carry the water that can be carried by the two-inch pipe. Some water in the two-inch pipe will have to back up or be reflected. A similar situation is created by a direct junction between relatively low resistance open wire and comparatively high resistance cable. Maximum power at carrier frequencies cannot be efficiently transmitted between the two. An electromagnetic wave is associated with the current that cannot enter the higher resistance cable conductor. While a portion of the current may be halted, the electromagnetic wave cannot suddenly disappear. Instead the wave is reflected back towards its originating point in the form of a reflected electromagnetic wave.

In many short-haul carrier systems, a reflected electromagnetic wave may not create any serious obstacle to speech transmission. However, serious impairment on long-haul circuits can be caused by reflected waves.

The closest comparison that can be made to a reflected electro-magnetic wave is an ordinary echo or a reflected sound wave. A reflected sound wave will cause an echo if the time between the original and reflected waves is sufficiently great to allow the ear to distinguish between the two waves. If atmospheric conditions are favorable, a rock wall of a valley will reflect or echo sounds to a person on the other side of the valley. If the person moves close to the wall the effect of the reflection or echo is lost. At close range the time lag between both sounds is practically nil. As a result, both sounds tend to blend as one.

A similar conditon may occur on a transmission line where a terminating mismatch or another type of impedance irregularity exists. If these conditions are present and the length of the line and the line velocity create a sufficient time interval, a person speaking over a long distance line may hear a reflection or echo of his own voice.

Electromagnetic wave reflection is undesirable and specific measures are taken to eliminate this kind of transmission interference. Stating that wave reflection is undesirable should not be understood as meaning that wave reflection will create a unform decrease in the transmission power or current.

Actually, wave reflection merely interferes with the initial wave. At certain points along the line the reflected wave adds to the initial wave. At other points the reflected wave subtracts from the original wave. As a result, effective voltage or current values are greater at some points than at others.

[**EDITOR'S NOTE:** *One of the topics to be discussed in the next installment is how transformers are used to match impedance irregularities.*]

V V

Bell System Reports Heavy Ice Damage in Southern States

An estimated $1,600,000 ice damage to facilities of the Southwestern Bell Telephone Co. as a result of the cold wave was suffered in its five state area, the company's office in St. Louis, Mo., said recently.

Texas suffered most of the damage while in Missouri and the St. Louis area losses were comparatively light, a company spokesman said.

• • •

The ice storm in the mid-south caused an estimated $3,000,000 damage to Southern Bell Telephone & Telegraph Co. poles and lines.

It was the biggest loss in the company's history.

V V

"We have grown into a self-centered nation of people, each separate section demanding the maximum of benefits from a munificent government, caring little whether others are treated likewise. As a result the national cost of living has grown to such proportions that our original dollar has been cut to less than half its former value."—Mayville (N. D.) Tribune.

• • •

>> Woman to husband as she arrives in auto with smashed front: "And the policeman was so nice about it. He asked if I'd like for the city to remove all the telephone poles."

Courts and Commissions

Rate Plea Refused, Company Charges Called Discriminatory

The Nebraska Railway Commission refused a request of the Inman Telephone Co. for authority to increase rates ranging from 66⅔ cents to 75 cents a month, on the ground that it would perpetuate a discriminatory situation that now exists, where stockholders are charged 50 cents a month less than nonholders. Instead it directed the company to charge a uniform rate of $2.00 on all classes of service.

The company started business as a mutual with all subscribers holding a share of stock. In recent years, without asking authority from the commission, it has been offering service to other persons. This makes it a common wire carrier, subject to state regulation.

The commission found that the company was guilty of discrimination in charging two sets of rates for identical service, and that as the $6.00 a year differential asked for stockholders would result in each getting a 6 per cent dividend, regardless of company earnings, this practice would violate the constitutional provision permitting payment of dividends only when net earnings after payment of operating expenses and setting a sufficient depreciation reserve allow.

The company serves 96 subscribers over a grounded system.

V V

Telephone Service Substituted For WU in Six Ohio Towns

The Ohio Supreme Court on Feb. 14 held that Western Union Telegraph Co. can close its offices in six Ohio towns and substitute telephone service on an agency basis.

The towns affected are Bellefontaine, Delphos, Lebanon, Marysville, Mt. Gilead and Ottawa.

The Federal Communications Commission approved the action, but the Ohio Public Utilities Commission sought to block the move with a mandamus suit in Franklin County common pleas court. That court held a substitute service was offered and that abandonment was not contemplated. Higher courts affirmed.

V V

NW Bell To Extend Service To Nebraska Law Agencies

The Northwestern Bell Telephone Co. has been authorized by the Nebraska Railway Commission to revise its tariff sheets so as to permit federal, state, county and municipal law enforcement agencies the use of toll message and exchange services for the transmission of finger prints, ballistic data, identification photographs and so forth, through the use of customer-owned telephotograph equipment. Such use has heretofore been limited to the press. No changes are made in the existing rate for newspapers or for law enforcement agency use.

The company was also authorized to revise its tariffs for its exchange at Ogallala, where stations have increased in 10 years from 552 to 1,321, setting up a new base rate area that will place patrons who now pay on a mileage formula in several suburban areas on the city rate basis.

Approval also was granted on a request for clarifying the use and length of retractible cords.

V V

Florida Company Enters Rate Increase Petition

The Southeastern Telephone Co., Tallahassee, petitioned the Florida Railroad & Public Utilities Commission for a rate increase on Feb. 19.

The increase would allow the company to earn a return of 7 per cent on its investment.

V V

Two Towns Get Dial Service

A recent order of the Louisiana Public Service Commission directed the Lafourche Telephone Co., Inc., to establish dial telephone service in Larose and Cut Off, and authorized the Southern Bell Telephone & Telegraph Co. to discontinue service to those towns. The Lafourche company was also ordered to extend scope of service between Larose, Cut Off, Galiana and Golden Meadow.

V V

Minnesota Commission Authorizes Five Sales

Five sales have been authorized by the Minnesota Railroad & Warehouse Commission, three involving purchases by Park Region Mutual Telephone Co., Dalton, one purchase by an individual, Waldon E. Piehn, and the fifth by Dwelle Telephone Co., Lake City. The first four named received approval on Feb. 19 and the latter on Feb. 16.

The Park Region company had made application to purchase Maine Cooperative Telephone Co., Underwood; Battle Lake Telephone Co. and Amor-Dead Lake Telephone Co. with its exchanges at Amor, Maine, Dead Lake, Ottertail, and Everts.

Mr. Piehn received authority to purchase all the capital stock of Harmony Telephone Co.; and Zumbro Falls Farmers' Telephone Exchange Co. was to be bought by the Dwelle company.

V V

Kentucky Company Supports Rate Request by Deposition

The Consolidated Telephone Co., Florence, supported by deposition on Feb. 15 its application to the Kentucky Public Service Commission for a $29,000-a-year rate increase.

Climbing costs of labor and materials have brought revenues down to an unsatisfactory level, the company said.

The commission set Mar. 6 for cross-examination of company witnesses. The rate increase was put into effect Sept. 1 under refund-guaranteeing bonds.

V V

Louisiana Exchange Sold

The Southern Bell Telephone & Telegraph Co. was recently granted permission by the Louisiana Public Service Commission to purchase the Washington, La., exchange from the South-

western States Telephone Co., Brownwood, Tex.

V V

Southern Bell Asks Higher Rates in Mississippi

R. R. Stubbs, assistant vice president in the finance department of the Southern Bell Telephone & Telegraph Co., testified before the Mississippi Public Service Commission on Feb. 14 in support of a petition by the company for a $2,400,000 raise in rates.

He told the commission the company now needs a 7.25 per cent return on its total investment in the state. That investment is figured at $35,000,000.

The proposed increase in rates would bring the company's earnings in Mississippi to the 7.25 per cent level, Mr. Stubbs said. He explained that credit deterioration and an increase in operating risks forced the company to raise its earnings rate from 6⅔ per cent—the figure requested when Southern Bell received its last rate increase in Mississippi in 1948.

V V

SW Bell Files for Rehearing On Arkansas Rate Decision

Southwestern Bell Telephone Co. on Feb. 9 filed for a rehearing on the rate increase granted recently by the Arkansas Public Service Commission.

It was the second appeal in the case. A group of cities, also dissatisfied with the commission's decision, has asked for reconsideration of the increase.

The commission, by a two to one vote, granted the telephone company an annual rate increase of $3,605,591 on Jan. 22. (TELEPHONY, Feb. 3, p. 16.) The company had requested $4,600,000.

V V

S. C. Commission Denies Southern Bell Rate Petition

The South Carolina Public Service Commission on Feb. 14 denied in full the Southern Bell Telephone & Telegraph Co.'s request for a $1,800,000 a year increase in rates at its 64 South Carolina exchanges.

The company had posted a $2,000,000 bond last fall to guarantee rebates, in case the rate increases were not allowed, when it went ahead with higher rate schedules pending a commission decision. (TELEPHONY, Aug. 26, p. 26.)

V V

Buys Kansas Exchange

Sale of the Alexander telephone exchange, formerly owned by Mr. and Mrs. M. W. McCall, to Ben Ummel, Galatia, has been approved by the Kansas State Corporation Commission. Mr. Ummel will take over the company Apr. 20.

V V

Suspends Rate Increase Of Illinois Commercial

The Illinois Commerce Commission on Feb. 20 suspended until Aug. 25 the petition of the Illinois Commercial Telephone Co., Springfield, for a $1,225,000 annual rate increase.

The action will permit further public hearings on the petition and prevent the proposed increase from going into effect before Aug. 25 unless the commission authorizes it in the meantime.

V V

Nebraska Commission Takes Action on Five Cases

The last chapter in the story of the Verdel Telephone Exchange was written by the Nebraska Railway Commission when it dismissed on Feb. 23 the application of the former owner, R. H. Walker, for authority to close the exchange because it was operating in the red. Later Mr. Walker asked that the commission hearing be canceled as he had disposed of the property. Confirmation of the sale by G. F. Franklin, secretary of the Verdel Commercial Club, the purchaser, was followed by dismissal of the entire proceeding.

Authority was granted the Lincoln Telephone & Telegraph Co. to offer for $1.00 a month rental sound-powered headsets with one stage amplification, and $1.50 a month for a handset telephone with three stages of amplification built into the set, devices designed to aid persons with impaired hearing in using telephone service.

Finding that there is need for law enforcement agencies to use a special type of service heretofore restricted to the press, the commission authorized the Lincoln Telephone & Telegraph Co. to provide telephotograph equipment to be used with toll circuits for quick transmission and reception of fingerprints, ballistic data, identification photographs and similar materials.

The Northwestern Bell Telephone Co. was authorized to liberalize the base rate area at its Ainsworth exchange to meet the modern and expanding conditions of the community.

The commission, at the request of Otto Fuerst, general manager, has dismissed an application by the Platte Valley Telephone Corp., filed in December, 1949, for authority to increase rates at 11 of its exchanges to cover added expense that would result from the enforcement of the Fair Labor Standards Act that became effective in January, 1950. The application had not been prosecuted, and on Feb. 15, Mr. Fuerst asked to withdraw it.

V V

Canadian Bell Shareholders Approve Mortgage Bond Issue

Shareholders of Bell Telephone Co. of Canada on Feb. 22 approved a by-law authorizing the directors to create and issue a series of first mortgage bonds to a maximum of 50 million dollars.

Frederick Johnson, president, said present estimates "are that the new capital required to finance our construction program up to the end of 1951 will total approximately 40 million dollars."

V V

Answers Show Cause Order On Rates, Service

Representatives of the Mooresville Telephone Co. appeared before the North Carolina Utilities Commission on Feb. 20 under order to show cause why its earnings should not be reduced and its service increased, and told the commission that the company is attempting to meet both demands.

The commission charged that the company was realizing a 12.5 per cent rate of return, nearly twice the accepted fair rate; that it failed to keep proper books and records and had not "discharged its responsibility and obligation to provide a satisfactory and expanding telephone service," particularly in the rural areas surrounding Mooresville.

After the hearing, the matter was taken under advisement by the commission.

V V

Oklahoma Association Calls REA Co-op Bill "Dangerous"

Oklahoma Senate Bill No. 155 by Mr. Boecher, Kingfisher, and sponsored by 21 senators and 20 representatives as co-authors, was branded as, "The most dangerous piece of legislation that has ever faced our industry," in a joint statement issued by C. C. Browne, president, and H. D. Straughn, secretary, of the Oklahoma Telephone Association.

If the bill should become a law in its present form the telephone industry in the state would be "doomed," the statement adds (TELEPHONY, Feb. 24, p. 26).

The bill provides for the formation and organization of rural telephone cooperative groups to operate on loans from the Rural Electrification Administration. It is modeled after an existing Oklahoma law under which REA

electric cooperatives have been operating in the state for 15 years.

The association has asked Oklahoma telephone people to appear before a special committee hearing on Feb. 27 to urge their objections to the measure as now written.

While under existing laws telephone companies may borrow money from the REA if they can meet the required qualifications, the bill provides that any telephone company may be converted into a cooperative and, "is especially lenient to foreign co-ops operating in adjoining states, permitting them to move across the state lines at will and under no control," the association statement charges.

The statement continues:

"That just means that they could work out their own territory boundary lines with no one to consult but their own conscience and if they wanted any part or all of the territory we are serving, there would be no need to offer to buy it but they could just move in, overbuild us with government money and starve us out. We would have no one to protect us. Rural towns of less than 1,500 population are defined as rural areas but Section 4 (d) contains a joker that would let them move into a town or city of any size. Their rate structure would be of their own making, and experience in other parts of the country shows rates higher than any private telephone company of any size has yet offered for rural service. If the subscribers wanted to protest rates or any service failure they would have no one to appeal to.

"Section 32 exempts them from *all taxes of any kind* except for an annual $10.00 fee per co-op. Now with tax-paying private industry being taken over in wholesale lots and becoming tax free, just what will that do to our state and county revenues? You might ask your school board, your city council and other tax paying business men what they would think of that kind of a set-up.

"True, REA has operated as tax free co-op groups but they have not strangled out so much private tax-paying business in this state. They are trying hard to do so and unless checked, will soon monopolize the electric power field. They should be paying taxes and it is no excuse to point to them as an example for exempting telephone co-operatives from fair taxes. For every tax free group that is set up, strangling tax-paying industry, a greater tax must be borne by the rest of us. Is that the basis on which this country was founded and can it continue to operate under that trend?"

V V

Nebraska Commission O.K.'s Rates to Yield 6.2% Return

A new schedule of net rates that will increase gross revenues $1,071 per year has been granted the Staplehurst Telephone Co., by the Nebraska Railway Commission. (TELEPHONY, Feb. 3, p. 16.) The company provides a magneto

This announcement appears for purposes of record only. These securities have not been and are not now being offered to the public.

$300,000

Middle States Telephone Company of Illinois

3½% Sinking Fund Debentures

Due January 1, 1966

$300,000

Southeastern Telephone Company

3½% Sinking Fund Debentures

Due January 1, 1966

This financing has been arranged privately by the undersigned. We are pleased to discuss problems of finance with corporation officials without thereby creating obligations of any kind.

Harris, Hall & Company
(Incorporated)

111 West Monroe St.
Chicago 3, Illinois

37 Wall Street
New York 5, New York

service over an entirely metallic system and serves 89 town subscribers with common battery and 166 rural with magneto service. One-party business rates are increased from $2.00 a month to $2.35, one-party residence and rural from $1.50 to $1.85.

The company has been operated for 47 years, and has approximately $10,000 of stock outstanding. For the year 1950, the total operating revenue was $7,102 against operating expenses of $4,390. After payment of $1,627 in taxes, there remained a net profit of $1,084.

The rates approved are estimated to increase revenues to $8,173, with expenses of $5,110. The net profit, after all expenses are paid, of $1,415 a year will produce a return of 6.21 per cent on an adjusted base of $22,806.

V V

Georgia Sales Tax Described As Broadest in Nation

Georgia's new 3 per cent sales tax, applying to all public utility charges except water bills, will go into effect Apr. 1 following Gov. Herman Talmadge's signature providing for its imposition.

Estimates of the revenue the new sales tax will produce vary from $75,000,000 to $150,000,000 a year. It is described as the broadest tax of its kind in the nation, applying to virtually all sales.

V V

Ohio Independent Receives Rate Increase

The Ohio Public Utilities Commission on Feb. 19 authorized the Fulton Telephone Co., Metamora, to increase rates in Lyons, Metamora and Richfield Center.

Commission engineers found the company was receiving a return of only 1.69 per cent on an investment of $228,569. The new rates will give a return of 4.20 per cent.

Old and new rates—one-party business, $4.25 a month to $6.00; two-party business, $3.75 to $5.50; one-party residence, $2.75 to $3.50; four-party residence changed to five-party, $1.75 to $2.50.

V V

Nebraska Independent Given Rate Increase

The Scotia Independent Telephone Co. has been authorized by the Nebraska Railway Commission to increase rates on all classes of service. (TELEPHONY, Feb. 3, p. 16.) The company operates a dial exchange and all lines are metallic. It serves a total of 273 subscribers, of whom 103 receive two-party service and 142 rural service. The management called attention to the absolute necessity of finding more switchboard capacity.

It is not practicable, said B. W. Ammerman, manager, to expand the dial equipment, and the only alternative was to downgrade certain subscribers. In taking care of this situation, it is proposed to place half of the two-party residence subscribers on four-party service. These are now paying $2.50 a month, and their rate will remain the same when they are changed to four-party.

As approved the new gross rates are: Individual business, $4.75, an increase of 75 cents; two-party business, $3.50; individual residence, $3.25; two-party residence, $2.75; four-party residence (new) $2.50. There is no change in rural rates.

Based on the present development the new rates will produce additional gross revenues of $381 per year. For the operating year of 1950 gross revenues were $9,626, operating expenses were $4,561, prior to taxes and interest, with net profit, after all charges against income are considered, of $2,974 on an investment of $49,974. The approved rates are estimated to have little effect upon net revenues, as salaries of clerks and traffic expenses will be increased.

V V

SW Bell Interim Rate Increase Request Denied in Oklahoma

The Oklahoma Corporation Commission on Feb. 23 denied a motion by John Cantrel, general counsel for the Southwestern Bell Telephone Co. in Oklahoma, for an interim rate increase to be effective pending final determination of the company's $10,100,000 permanent rate increase application in Oklahoma (TELEPHONY, Jan. 27, p. 22).

"This commission will try to do right and justice to the company and the people," said Reford Bond, commission chairman, in making the ruling. "The commission will try to give the company a fair return on its investment. The commission will try to give the people a fair rate. It will deny the motion for an interim rate increase," he concluded.

In filing his motion for the interim increase, Mr. Cantrel said that he had made every effort to bring the proceedings to an early termination and had "expedited the matter in every possible way." He charged that "obstructionist tactics sometimes amounting to improprieties, have served to defeat the ends of justice and to render almost futile the efforts to conclude the proceedings. As I view it the responsibilities of this commission for proper and just regulation of public utilities in Oklahoma are now at stake."

The hearing was continued until Mar. 8 upon request of John Ogden, one of the opposing attorneys, who said he wanted to introduce further evidence to support charges that two commission members and several employes were taken on a trip to New York at company expense to inspect Bell laboratories and facilities of Western Electric Co., Bell manufacturing subsidiary.

V V

Arizona to Hire Rate Experts For Study of Utility Cases

Arizona's House of Representatives passed on Feb. 17 and sent to the Senate, a $50,000 appropriation to hire rate experts and other specialists to make studies in utility rate cases.

The fund would be expended by the Arizona Corporation Commission on the approval of the state attorney general, who would use the experts as witnesses in court and commission hearings.

V V

Nebraska Ownership Change

The telephone exchange at Naper, Neb., operating under the name of Farm & Home Telephone Co., was recently purchased by C. E. Swallow of Naper. He is now operating the property.

V V

Summary of Commission Rulings and Hearings

California Public Utilities Commission

Feb. 13: Hearing on application of Western Telephone Co., Weaverville, for authority to increase rates at its Garberville, Laytonville and Covelo stations and to establish continuous service at the latter two; to issue 8,600 shares of cumulative preferred stock in Humboldt and Mendocino Counties.

Florida Railroad and Public Utilities Commission

Mar. 27: Hearing on application of Southeastern Telephone Co., Tallahassee, for authority to increase intrastate rates.

Kansas Corporation Commission

Mar. 5: Hearing on application of Goessel Telephone Co. for authority to change rates.

Mar. 5: Hearing on application of Spearville Telephone Co. for authority to change rates.

Mar. 6: Hearing on application of Consolidated Telephone Co., Burrton, for permission to sell exchanges at Buhler, Haven, and Burrton, to Consolidated Telephone Co., Inc., and of latter to issue $42,000 of first mortgage bonds and 10,000 shares of no par common stock.

Mar. 6: Hearing on application of M. Skiles to sell and L. Skiles to buy Circleville Telephone Co.

Mar. 13: Hearing on application of Reno Telephone Co. for authority to buy and A. P. Telephone Co. to sell properties at Abbyville and Plevna territory; and for authority of former to change rates and issue $30,000 of common stock.

Apr. 2: Hearing on application of Cawker City Mutual Telephone Co., Cawker, and Ozark Township Telephone Co., Colony, for authority to change rates.

Apr. 9: Hearing on application of the Waco Telephone Co. for authority to operate in the eastern part of Cherokee County and southeastern part of Crawford.

New York Public Service Commission

Feb. 26: Hearing on petition of Upstate Telephone Corp. of New York, Johnstown, for authority to increase rates.

Oklahoma Corporation Commission

Mar. 6: Continued hearing on application of Kellyville Telephone Co., for authority to increase rates.

Mar. 13, 14: Continued hearing on application of residents of Medford and other towns for free interconnection with the Southwestern Bell Telephone Co.

Pennsylvania Public Utility Commission

Feb. 28: Hearing on complaint of Lewis E. Miller *et al* against Delaware Valley Telephone Co., Erie, alleging that proposed increased rates are unreasonable and requesting that they be suspended.

Wisconsin Public Service Commission

Feb. 27: Hearing on commission motion to investigate operating practices of Manawa Telephone Co. and Weyauwega Telephone Co.

Feb. 27: Hearing in matter of extension of service, brought by E. Billerbeck vs. Fremont Telephone Co. and Poy Sippi Telephone Co.

Feb. 27: Hearing on adequacy of Wisconsin Telephone Co. service, brought by Phi Delta Theta House Association.

Feb. 28: Hearing in matter of extension of service, brought by E. Lehman vs. Berlin Telephone Co. and Wisconsin Telephone Co.

Mar. 1: Hearing on application of Pleasant Valley Telephone Co., Pleasantville, for authority to increase rates.

V V

Duty as Seen by Lincoln

"If I were to try to read, much less answer, all the attacks made on me, this shop might as well be closed for any other business. I do the very best I know how—the very best I can; and I mean to keep doing so until the end. If the end brings me out all right, what is said against me won't amount to anything. If the end brings me out wrong, ten angels swearing I was right would make no difference."

—Abraham Lincoln

In the Nation's Capital

(Concluded from page 14)

buy all that America needs abroad through controlled prices in international agreements. Just how this could be managed without wrecking a free world market (or what is left of it) is not explained.

On the suggestion of manpower controls, the CWA statement again goes soft. The 40-hour basic week must be maintained. Overtime pay beyond this must be allowed. "There is no need for manpower draft." But a bigger program of defense housing is needed, along with a socialized health program and other uses of federal moneys and scarce materials for purposes which might well, in this writer's opinion, contribute to the inflation spiral, at the expense of the defense effort.

Down with the State Commissions?

But it is in the realm of telephone rate-making that the CWA brings forth its most far-reaching and, at the same time, its most specific suggestion. Without saying it in so many words, CWA wants to torpedo all the state regulatory authority for fixing telephone rates. It wants all such authority concentrated in the hands of a single federal rate-making agency.

Skipping gingerly over legalistic barriers and serious constitutional questions, the CWA thinks that something like a Federal Telephone Commission, with full authority to fix local and intrastate rates, would eliminate existing disparities in the telephone toll rate structure. The statement refers to the controversy which has developed between the state commissions and the Federal Communications Commission over such disparities. These disparities have developed largely as a result of continuous *interstate* rate cutting by the FCC, which is the federal regulatory commission already on the scene, over the protest of the state commissions confronted with the demands for local rate increases. This factor was ignored.

In other words, the FCC made this problem. But the CWA proposal would give the FCC all the authority to fix telephone rates everywhere, even local telephone rates. The state commissions, which have been the first to protest against disparities, would have to disappear.

The whole CWA program, as envisioned in these statements, is obviously the production of "planners" within the CWA who are still riding along on the "Papa-knows-best" theory which became fashionable with the federal bureaucrats within the last two decades. In a nut-shell, we should turn over all authority to Washington. Centralize all controls in the hands of federal agencies. Then we can sit around waiting for the benefits of a benevolent socialized dictatorship installed to guide the destinies of all the citizens—wards of the nation-at-large. Repeated failures and collapses of such one-track mind planning, in the strongly socialistic central government of Europe, makes no impression upon such a mentality. This is the same road that Hitler, Mussolini, and Stalin traveled long ago to centralized power. "That government is best which governs most" seems to be the watchword of neo-federalists who have stolen the mantle of liberalism in these topsy-turvy times.

V V

Cleveland Is Promoted by Lincoln T&T

Lloyd W. Cleveland has been named by the Lincoln (Neb.) Telephone & Telegraph Co. as staff assistant in the office of Merle M. Hale, general commercial superintendent, and will work on special assignments regarding commercial phases of company operations in its 122 exchanges.

Mr. Cleveland has been with the company since 1934, starting as a salesman in the Lincoln commercial office. He had worked in the commercial department in York, Hastings and Lincoln, with a three-year army stretch.

He has been area commercial manager at York since 1946. He is past president of the York Junior Chamber of Commerce, and a director of the senior chamber.

V V

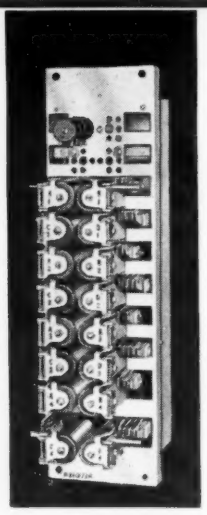
R. P. Sullivan Moves to Dallas

R. P. Sullivan, general plant superintendent, Kentucky Telephone Corp., Lexington, Ky., on Mar. 1 was transferred to the Southwestern Associated Telephone Co., Dallas, Tex., which he will serve as general traffic superintendent. Both companies are subsidiaries of General Telephone Corp.

V V

Incorporation

The Kansas Secretary of State on Feb. 19 issued a non-profit charter to the Cimarron Valley Telephone Association, Inc., Meade. Joseph E. Bragg and eight others were incorporators.

Automatic Electric's  * Subscriber

For the man who has to be

MEET the needs of doctors, lawyers, realtors, contractors, and other business and professional men who must receive telephone calls in two places. Simply offer them Subscriber Transfer Service — a unique service that automatically routes their calls from one place to another — at an additional charge which builds up your revenue!

With this service, your subscriber has but a single telephone number for clients and business associates to remember; his calls always reach him in whichever place he happens to be.

Your own directory will show you many prospects for this service! Point out its advantages to the business men you serve. The Subscriber Transfer Unit is adaptable to either manual or automatic systems, for either 24- or 48-volt operation. Ask us for details.

AUTOMATIC ELECTRIC

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places at once!

A Flick of This Key and Calls Are Transferred Automatically The doctor switches it one way when he leaves the office; calls are then automatically routed to his home. When he returns he switches it back to restore service (this telephone rings on every call, in case he forgets).

* The Subscriber Transfer unit mounts in the central office; transfer service between any 2 telephones is quickly arranged by jumper connections at the distributing frame. Unit shown provides for 4 circuits; others available for 1, 2, or 3 circuits.

telephony's *SAFETY* bulletins

No. 24—EXTENSION CORDS. Usually a fire is caused by a small thing—maybe by a defective extension cord. Read this article for suggestions on how to eliminate this danger.

by FRANK E. LEE

FIRE!! In the distance a siren starts its wail of lament and fear. A tingling races down your spine. Fire on a rampage can put you out of business! Even worse, in a national emergency a fire could cause incalculable damage.

Whenever there is a fire, someone attempts to determine the cause, and in many instances defective extension cords must be blamed.

Soon the fire becomes a distressing memory and an insurance company statistic. Large amounts of money are spent to restore the damage, while company advertisements tell the public how quickly telephone service was restored after the fire.

However, before we have a rebuilding job to tackle, how about catching that fire before it starts? Which extension cords may cause a fire? Any of them!

There are cords on soldering irons, electric shop tools, floor cleaning equipment, electric fans. Other cords are to be found on vending machines, radios, clocks, letter openers, letter sealers, floor lamps, desk lamps, and a whole host of electrical apparatus found in practically every telephone exchange.

Any of these cords can become defective. They wear out, deteriorate, or become damaged to a point where they are unsafe carriers of electric current. For this reason, inspections should be made to determine the condition of every extension cord in all company buildings. These inspections fall into two general categories, namely: (1) Daily observation, and (2) routine examination.

All workers should be fully alerted to the possible fire hazard of each cord, and should be instructed to take careful note of any defect while the item is in daily use. Repairs should be arranged immediately when a defect is discovered. In addition to these inspections, a regular routine should be set up for a check on all cords, to make sure that all are in a safe condition. Even cords with little apparent wear, as for instance a clock cord, should be carefully inspected for drying out or other damage.

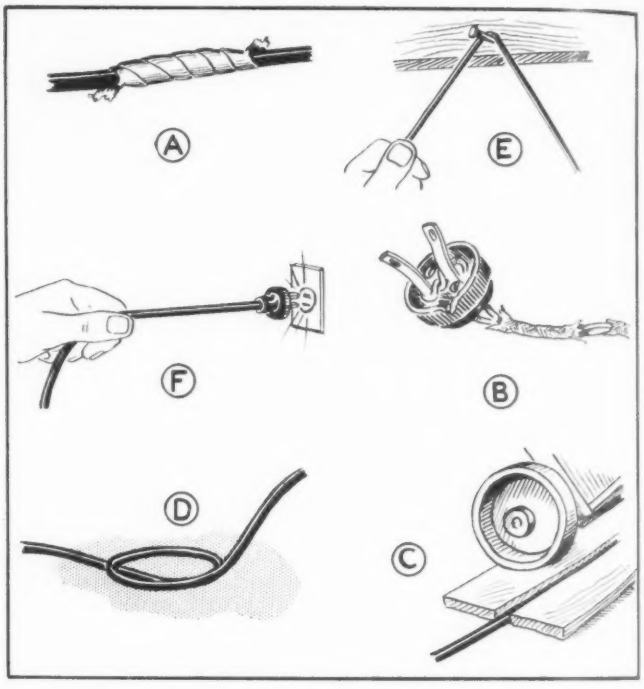
Safety Inspection of Extension Cords

When making a safety inspection of extension cords, the following items should be watched carefully:

(1) *Insulation.* Look for spots where the insulation may be worn or broken. During routine inspection observe if rubber covered cords are dried out or brittle. Roll the cord over the fingers and look for tiny cracks in the jacket. If the cord is dried out, brittle, or cracked, schedule it for immediate replacement. A good practice is to replace cloth covered cords that are frayed or the outer cover of which feels lifeless to the touch. Also, always replace any cords that have been patched or spliced by well-meaning but careless workmen (see (A) in illustration).

(2) *Plug.* Look at the plug. All plugs should be of substantial material and design. Usually a fibre bushing or insulator is placed over the prongs after the cord conductors are terminated. If the plug requires an insulator, check to determine if the insulator is in place. Arrangements should be made to replace all missing, broken, or cracked insulators (B).

(3) *Grounded Plugs.* Certain apparatus and equipment is equipped with a three-conductor cord. The third conductor provides a means to ground the frame of the apparatus or equipment. This affords a certain amount of protection against dangers which might be caused by a crossed frame. Where three-conductor plugs are used, a check must be made to be sure the ground, or third lead, is properly fastened to the plugs or that a good ground is connected to this wire.



(4) *Location of Cord.* Look for hazards of use which may cause rapid deterioration of the cord. A cord lying adjacent to an open window may get wet during a rainstorm. A wet cord is a potential fire hazard.

Even the best cords will wear out prematurely if rolling ladders or hand trucks are continuously rolled over them (C). Along the main frame, where rolling ladders may be used, cord reels reduce cord expense and eliminate a possible fire hazard.

(5) *Use of Extension Cord.* Care should be used to keep extension cords away from water, oil, etc., that may get on the floor (D). Also, cords must be kept away from flame or intense heat. Pulling a cord over a nail or around a sharp corner may tear the cover (E). To correct this condition, consider the installation of additional outlets where needed.

When placed in storage, keep the cord on top of the tool, not on the bottom. The weight of the tool may cause unnecessary damage. A good comparison is to treat extension cords with the same care given an instrument cord.

The correct way to disconnect an extension cord is to grasp the plug in the fingers and thus pull it gently from the socket. Extension cords are damaged, connections are loosened, and plugs are broken when the cord is grasped in the hand and the plug is yanked from the socket (F). Extension cords are made to conduct electricity—use them correctly.

Proper use and care of extension cords is one of the

little details of safety. Still, taking care of a lot of little things is the big job of any safety program. A little time is required to make inspections, and a little more time is needed to correct hazardous conditions. However, the dividends earned from this little time used for safety are counted in money saved, freedom from service interruptions, and peace of mind.

Remember—YOU HAVE THE TIME FOR SAFETY.

LOUISIANA ASSOCIATION HOLDS CONVENTION

By J. M. NELSON
Vice President
Louisiana Telephone Association

THE annual convention of the Louisiana Telephone Association was held in the capital city of Louisiana Feb. 2 and 3 in the throes of the state's severest cold weather since 1918.

While attendance was sorely hurt by the weather conditions and icy roads and the need for many telephone officials to be at home at work, those delegates attending enjoyed one of the most interesting meetings in the history of the association.

The convention speaker who came the farthest to meet with the Louisiana group was Ray Dalton, Everett, Wash., president of the United States Independent Telephone Association.

Mr. Dalton spoke of the work being done by the USITA. He praised the association workers who acted to protect telephone campanies from increased taxation of unreasonable status in the excess profits tax enacted recently.

"One of our most vexing difficulties today lies in the need for more adequate financing," Mr. Dalton told the convention. He pointed out that over a six-year period, there has been a shrinkage of more than 9 per cent in Independent exchanges and nearly 10 per cent in Independent operating companies. Changing conditions, requiring modern plants and improved equipment and technical complications, beyond the financial abilities of companies, have resulted in this shrinkage, he said. "The small operator has become the focus of insistent demands for more and better service. His financial problems are becoming increasingly difficult."

"American predominance in world telephone development owes so much to the sturdy initiative of men with little capital who carried the telephone idea into far-flung rural areas," he said.

The USITA president stated that some financial relief appears to be possible through both private lending institutions and the REA telephone program. He expressed a hope that relief will soon be more a reality.

"Teach your men to think, not just memorize the book," was the advice brought to the convention by A. T. Ramsay, Atlanta, Ga., general plant engineer, Southern Bell Telephone & Telegraph Co.

He warned that exchange managers must first think, themselves, if they are going to get their employes to think about their work. This will lead to employes doing a better job for they will "put their heart into it."

Mr. Ramsay cited the importance of telephone management knowing the goal, although any program may be speeded up or slowed down as circumstances demand. "We need a reasonable forecast of plant growth, but any error in forecast is only an error in time. It can easily be adjusted during the program," he stated.

Mr. Ramsay paid tribute to Independent telephone companies and manufacturers, declaring they constantly contribute greatly to the industry.

Maintenance and construction problems discussed by Mr. Ramsay were particularly interesting to the delegates, since at the time telephone facilities throughout the state were suffering disruption from the unseasonable weather.

He pointed out that the weather was causing approximately as extensive disruption as the last previous comparable cold snap 20 years ago. He said that "tighter" replacement then would have failed to withstand this weather. This, he stressed, illustrated the inadvisability of building too well and too strong in areas such as Louisiana.

W. F. Corman, Atmore, Ala., secretary-treasurer of the Alabama Independent Telephone Association, told the convention that "opportunities abound in small telephone companies."

(Please turn to page 39)

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Alexander Graham Bell Elected to Hall of Fame

Alexander Graham Bell, inventor of the telephone, was one of six famous Americans elected to the Hall of Fame recently. Chosen with Mr. Bell for this signal honor were Dr. William Gorgas, medical scientist who ridded the Canal Zone of yellow fever; Woodrow Wilson, 28th president and inspiration for the League of Nations; Susan B. Anthony, leader of the women's suffrage movement and eighth woman to be named to the Hall; Theodore Roosevelt, 26th president; and Josiah Willard Gibbs, founder of the science of physical chemistry.

The six elected were the only candidates in a group of 186 who received the necessary majority of votes in the 11th election held by the Hall. They bring to 83 the number of distinguished Americans to be enshrined in the Hall of Fame. The maximum number admitted at any one election is seven. Candidates must have been dead 25 years and have been Americans by birth or naturalization.

Mr. Bell was also the unanimous choice of a nationwide group of high school students for election to the hall. Participating in this election were members of 373 national honor chapters and the entire student bodies of 33 schools throughout the country.

The Hall of Fame for Great Americans was originated by Dr. Henry J. MacCracken, a former chancellor of New York University, and was made possible by the generosity of Mrs. Finley J. Shepard. Consisting of an open air colonnade and a massive sub-structure, the Hall is located on the campus of New York University at University Heights in New York City. The first elections were held in 1900, and have been held every five years since.

Alexander Graham Bell was born at Edinburgh, Scotland, in 1847, the son of the distinguished speech teacher, Alexander Melville Bell, and was educated at the University of Edinburgh and University College, London. He was associated with his father in teaching elocution and vocal physiology in London before he came to Boston in 1871 to train teachers of the deaf in his father's system of visible speech.

As early as 1865, Bell conceived the idea of transmitting speech by electric waves. In 1875, while experimenting with a multiple harmonic telegraph, the principle of transcription and reproduction came to him and by Mar. 10, 1876, the apparatus was so far developed that the first complete sentence, "Mr. Watson, come here; I want you," was distinctly heard by his assistant.

After the commercial establishment of the telephone, Bell turned his attention to other subjects. He invented the photophone which transmitted speech by light waves and the induction balance, used to locate metal objects in the human body. He was also a member of a group which took out basic patents for phonograph recording on wax cylinders and discs.

He investigated the nature and cause of deafness and prepared an elaborate study of its heredity. In 1883, he founded the magazine *Science* which became the official organ for the American Association for the Advancement of Science.

The remainder of his life was devoted to aviation and it was his work which brought together Curtis, Baldwin and others who invented the aileron principle and developed the hydroplane. He died in 1922.

V V

Two-Way Television Opens New Educational Horizon

Johnny took his dose of reading, writing and 'rithmetic in a new form on Dec. 13. And he gobbled it up as if it were candy.

The dose was administered by two-way television at a demonstration, the scene of which was Baltimore, Md.

Television for educational purposes isn't new. Several cities have had such projects for a couple of years. But the manner in which it was tried in Baltimore hurdled one of the biggest criticisms of the present program—lack of personal contact between pupil and instructor.

By placing a camera and receiver in front of both the students and the teacher, the instructor may be anywhere and still be able to catch the reaction of the students and get questions and answers.

In this demonstration, the teacher was in the studios of the television station and her students were in the classroom several miles away. Each could hear and see the other.

A wrinkle in the experiment was the use of a "horizontal wipe"—electronic means of dividing the image in half, with the teacher on one side and the students on the other.

The scope of interest in the project was reflected in the persons who attended. The Atomic Energy Commission, the Armed Services, and the U. S. Department of Education, each had its top representatives in that field present, and several eastern cities had delegates.

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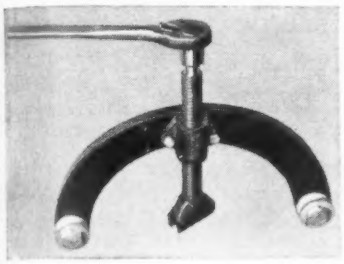
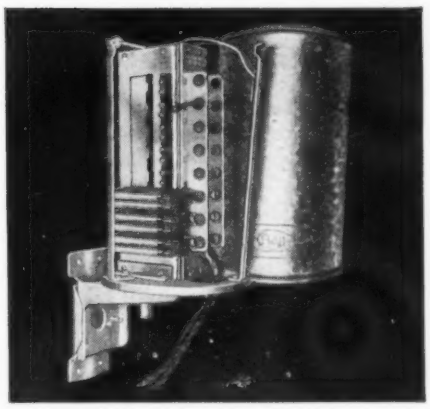


The same dependable Slack Puller, but with a ratchet added. This type of handle enables the operator to pull slack with the Little Giant Slack Puller, requiring even less effort than would be needed with the conventional model.

The correct tool for those who use the Puller day after day.

cook type S-20

pole cable terminal



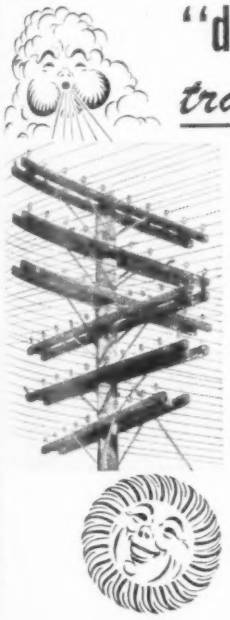
Can be used as a protected or unprotected terminal. Made in 6, 11, 16, or 26 pair capacity.

Cook Type S-20 Pole Cable Terminals are carefully engineered to offer the user:

MAXIMUM ECONOMY—because Cook Type H 20 Protector Units, containing fuses and primary and secondary lightning arresters, are added only as they are required.

MAXIMUM CONVENIENCE for installation and servicing. Drop wire connections are at front. Drops are led through individual insulating knockout holes. Self-soldering nozzle lies close to pole. Hood locks in raised position for working. Separate mounting bracket eliminates gaining of pole and provides easy installation.

MAXIMUM PERFORMANCE when used separately or as part of the Cook Trans-Mount System of Protection and Distribution. S-20 is of all steel construction, hot galvanized. Complete terminal designed for maximum insulation.



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THE PLANT MAN'S *note book*

IT HAS been reported that Britain will put more than seven and a half million dollars into its national television service—a program to bring almost her entire population within range of television by 1954. New transmitters will be built to reach more than 40 million people.

• • •

It has been said: "Something's going to slip sooner or later. The world is standing on Uncle Sam's shoulder; he's standing on the American taxpayer's back, and the American taxpayer is standing on the ragged edge."

• • •

Beware of what you say in the presence of a man carrying an ordinary brief case for it may contain a small battery operated voice recorder.

The writer witnessed a demonstration of such a device recently and it did a marvelous job of recording every word that was spoken in a fair sized room. The microphone was in the form of a baggage tag. The dry cell battery, it was claimed, would operate the recorder for about four hours without renewing. The sound track was embossed on a plastic belt. Each belt would accommodate one and one-half hours' continuous recording.

• • •

In New York City, where a subway ride and a call from a public telephone are now 10 cents, a dime is referred to as the "Truman Nickel." One old time telephone user reflects that when he was first married—a half century ago—he could buy a beefsteak for eight cents. Now, he states, he cannot call the butcher shop for that amount.

• • •

The writer recently witnessed a demonstration of a remote control device that appeared to have numerous possibilities for use in the communications field. The two control boxes, each powered by 110-volt, 60-cycle commercial current, were connected by a single wire circuit. A total of over 50 operations were controlled over this one wire. Lamps were lighted, dimmed and turned off at the flick of a switch. Buzzers were sounded, motors started, slowed down, stopped or reversed with ease.

• • •

On a trip to the Bell Laboratories recently, the writer was privileged to examine components of the submerged repeaters as installed on the Key West, Fla., and Havana, Cuba, submarine telephone cables. These electron tube repeaters are contained within the armour of the submarine cable and are designed to pass through the cable laying machinery and sink to the bottom of the ocean like a length of cable. It is estimated that they will not require servicing for changing tubes or defective circuit elements for perhaps 20 years. The repeater has the appear-

1951 CONVENTIONS

Texas Telephone Association, Texas Hotel, Fort Worth, Mar. 12, 13 and 14.

Nebraska Telephone Association, Lincoln Hotel, Lincoln, Mar. 27 and 28.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, Apr. 3 and 4.

Illinois Telephone Association, Pere Marquette Hotel, Peoria, Apr. 19 and 20.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, Apr. 23, 24 and 25.

Pennsylvania Independent Telephone Association, Abraham Lincoln Hotel, Reading, Apr. 30 and May 1.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 9 and 10.

United States Independent Telephone Association Executive Conference, Greenbrier Hotel, White Sulphur Springs, W. Va., May 14 and 15.

Kansas Telephone Association, Kansan Hotel, Topeka, Kan., May 22 and 23.

New York State Telephone Association, Mark Twain Hotel, Elmira, June 6 and 7.

California Independent Telephone Association, Palace Hotel, San Francisco, June 7 and 8.

Oregon and Washington Independent Telephone Associations (joint convention), Multnomah Hotel, Portland, Ore., June 15 and 16.

Michigan Independent Telephone Association, Olds Hotel, Lansing, Sept. 12 and 13.

Tennessee Independent Telephone Association, Nashville, Sept. 19 and 20.

Rocky Mountain Telephone Association, Newhouse Hotel, Salt Lake City, Utah, Sept. 27 and 28.

United States Independent Telephone Association (annual convention), Stevens Hotel, Chicago, Ill., Oct. 15, 16 and 17.

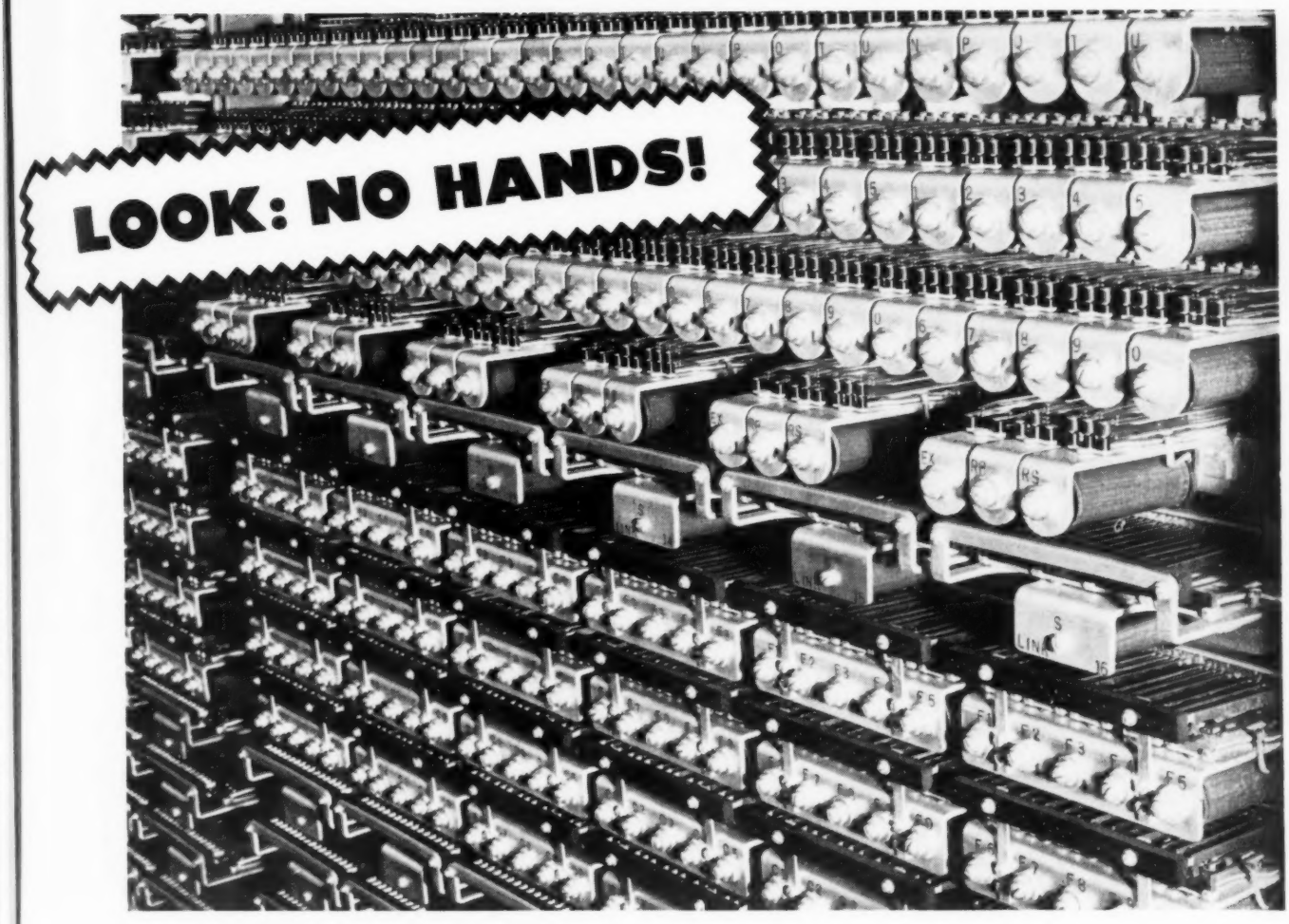
North Carolina Independent Telephone Association, Pinehurst (hotel unannounced), Oct. 25 and 26.

Virginia Independent Telephone Association, Roanoke Hotel, Roanoke, Nov. 1 and 2.

Florida Telephone Association, Tallahassee (hotel unannounced), Nov. 5 and 6.

Georgia Telephone Association, Dempsey Hotel, Macon, Nov. 8 and 9.

Alabama Independent Telephone Association, Jefferson-Davis Hotel, Montgomery, Nov. 12 and 13.



THERE is, of course, nothing new or surprising about a telephone switchboard unattended by operators. BUT! when we brag about "No Hands" we are referring to something *beyond* the mere handling of calls without manual aid. North "All-Relay" switchboards also serve year in and year out without extra "hands" for constant servicing. North friction-free, self-cleaning relays (and North boards are truly *ALL* Relay) provide uninterrupted switching with nothing more than occasional preventive maintenance.

You must see a North "All-Relay" exchange in action, look into its maintenance record, to appreciate how much you can save, how much better you can serve with North equipment. Let a North field engineer show you the facts on . . .

NORTH *"All Relay"* EXCHANGES

THE NORTH ELECTRIC MANUFACTURING COMPANY

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ance of a bulge in the cable about three inches in diameter and tapering in each direction to the normal cable diameter of a little over an inch. The total length of the bulge and taper required to accommodate a repeater is about 35 ft.

• • •

Someone has said that it is inspiring to observe the future Abe Lincolns studying their lessons in the flickering light of television sets.

• • •

In 1900, Europe's output per man-hour was substantially equivalent to that of the United States. Today, in average terms, it is between one-half and one-fourth that of the United States.

• • •

The official safety slogan of the Associated Telephone Co., Ltd., of Santa Monica, Calif., is: "Alert today—Alive tomorrow."

• • •

It has been said that turning your back on one problem brings you face to face with another.

• • •

A recent issue of the Ohio Bell magazine describes one of the newest developments to come from the Bell Laboratories, a prelasher, for use on aerial cables. This new machine is designed to lash cable and strand together as they are pulled from their respective reels.

Since the middle of December this equipment has been used on actual jobs in Canton, Akron and Cleveland to give it a "shakedown" test. The plant men are recording all of the good and bad points of the device and will offer recommendations for improvement after the field trial has been completed.

One of the indicated advantages is a reduction in the number of times a lineman must climb up and down poles when stringing new cable. The present method requires up to six trips up and down each pole to complete the job. This prelasher, however, reduces the number of trips to only two up and down, once to drill the pole and attach the roller and at the same time feed through the pulling line, and the last time to attach the cable permanently.

This idea is not entirely new, as a somewhat similar arrangement was tested some few years ago, but was abandoned because of the prelashed cable having a tendency to twist around the strand. It is claimed that this action is precluded in the present equipment by the use of an "anti-twist" device.

PLANT MAN'S QUIZ

Q. Please advise whether the telephone answering device makes use of the embossed or magnetic type of voice recording.

A. Both types have been developed and used to some extent. We have witnessed demonstrations of several machines of the embossed recording principle as well as the magnetic recording on both wire and tape. Both types appear to do an excellent job of mechanical telephone answering.

• • •

Q. Will it be possible to reduce the resistance of ground connections by the use of chemical soil treatment?

A. Tests made indicate that a considerable reduction may be made in ground resistance after chemical treatment of electrodes in locations where a good ground connection is normally difficult to obtain. The initial effectiveness of chemical treatment was more apparent where the soil was somewhat porous; this permitted the chemical solution to permeate a larger volume of earth and thereby increase the effective size of the electrode.

Where compact soils were treated, the reduction in resistance was not as effective initially as the solution tended to remain in its original location longer. It has also been found that chemical treatment limits the seasonal variation of ground resistance and also lowers the freezing point of the soil.

The most commonly used chemicals for the reduction of ground resistance are copper sulphate, sodium nitrate, calcium chloride and sodium chloride or common salt. Iron sulphate, potassium nitrate and ammonium sulphate have also been used rather extensively. Calcium chloride is hygroscopic and tends to retain moisture much longer than the surrounding soil. Powdered charcoal or coke has been used to some extent, but has not proved as effective as salts mentioned because there is no way in which these substances may be diffused through the soil to increase the effective size of the electrodes.

• • •

Q. What is the approximate increase in cost of telephone plant material during the past 10 years?

A. One operating company reports that during this period, poles have increased one-half times. Aerial and underground cables have increased one and one-half times. Other materials and equipment increased at even greater rates. Taxes increased from 50 per cent to 115 per cent.

In other words, the average investment per station of this company in 1939 was $105.80. In 1950, it increased to $190.25 per station. Needless to state, rates have not increased in the same ratio.

• • •

Q. Will the use of cross-connecting cable terminals prove an economy in the average local exchange cable distribution plant?

A. In general, this method is used to connect a main frame terminated cable pair to any one of a group of other cable pairs in the distribution plant. The high degree of flexibility essential to a satisfactory cable plant is almost assured by the proper use of cross-connections.

The principle of cross-connection makes available a choice of feeder cable pairs for those working circuits which are cross-connected. This arrangement permits some control of the distribution of working pairs in the feeder cable and tends to make it independent of geographical location. This flexibiilty increases the efficiency of the cable distribution plant.

The use of cross-connections may have other less important uses which in themselves would seldom warrant the cost of installation of the necessary special terminals in the plant. Some of these would be the improvement of party line fills, segregation of defective pairs, location of trouble, etc. In the average cable plant there are certain to be some individual feeder cables for which cross-connection is not necessary nor desirable. As a rule, however, some cross-connection is necessary in any efficient cable plant.

The provision of cross-connecting always entails much initial cost and some later increase in maintenance and station installation and removal costs. It is, therefore, necessary that each case be carefully investigated and local conditions evaluated in order to determine the economy of cross-connection as compared with other means of obtaining cable relief.

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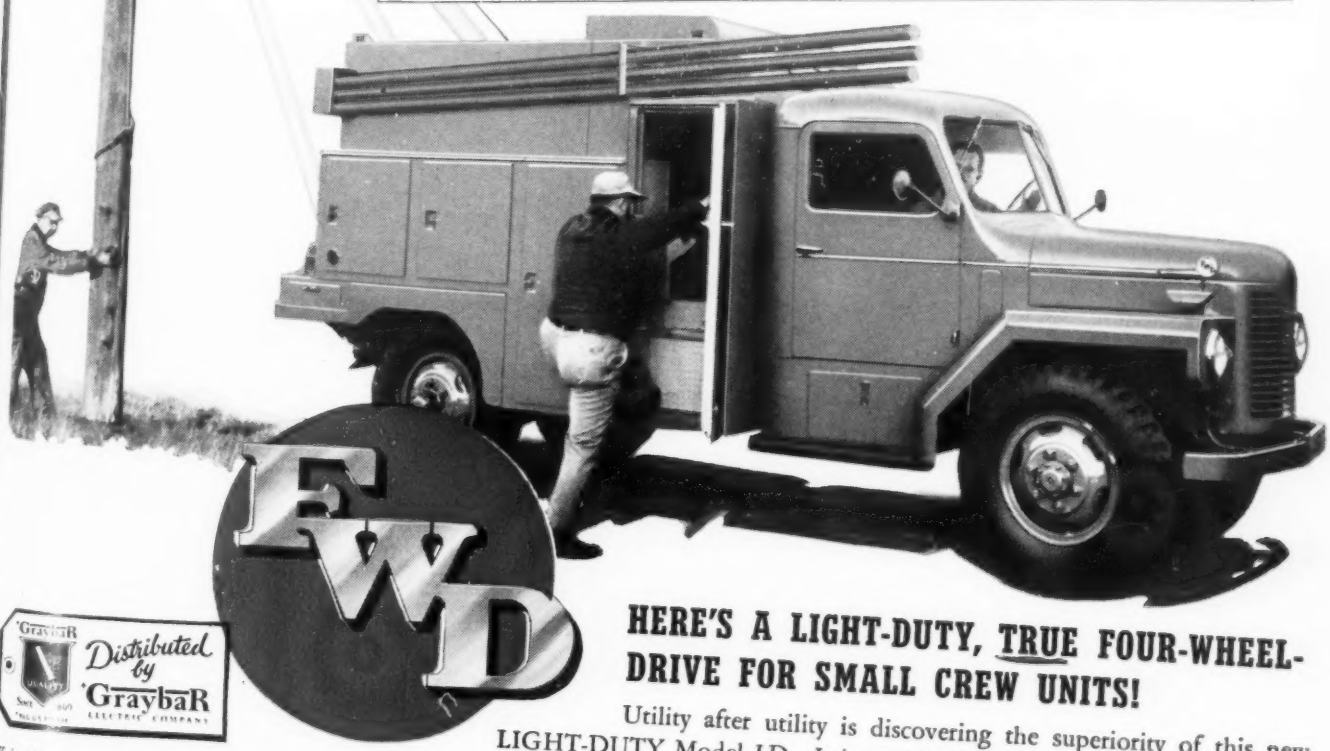

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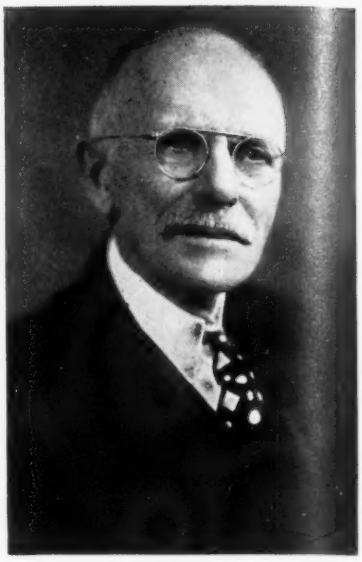
Built by the Makers of America's Foremost Heavy-Duty Truck

J. H. WRIGHT, INDEPENDENT LEADER, DIES

THE Independent telephone industry lost one of its most aggressive and colorful leaders in the death on Feb. 16 of John H. Wright, president of the Jamestown (N. Y.) Telephone Corp. Mr. Wright died while undergoing surgery in a Buffalo hospital, following a month's illness.

Mr. Wright had been in the telephone business for 53 years and throughout this period he was active in the affairs of the Independent industry nationally and in New York State and in his home-state of Pennsylvania, in which he started his telephone career. He was a staunch supporter of the Independents and was always in the forefront of any movement to protect and improve their welfare.



J. H. WRIGHT

Mr. Wright was a director of both the New York and Pennsylvania telephone associations for many years and served both organizations as president. He was one of the founders and a director of the old National Independent Telephone Association, and for many years was a director of the United States Independent Telephone Association.

In 1933-34 he was president of the Independent Telephone Pioneer Association.

Mr. Wright was born at Northeast, Pa., on Apr. 25, 1867. After receiving a common school education and serving as a reporter for the Chicago (Ill.) *Daily News*, he became publisher of several small-town weekly newspapers in Crawford and Warren counties of Pennsylvania.

It was his newspaper venture that indirectly led Mr. Wright into the telephone business, as in 1898 he began building telephone lines to connect the communities for which he published papers. Within three years after he had built his first telephone line he found the telephone business had outgrown his newspaper business.

Mr. Wright then joined the Warren (Pa.) Telephone & Telegraph Co. as secretary and general manager. In July, 1903, he went to Jamestown to become vice president and general manager of the old Home Telephone Co., which had been organized in 1901 to operate in competition with the Bell Telephone Co. there.

With the nation-wide movement to eliminate duplication of service by Independent and Bell interests, the Home Telephone Co. and the Bell company merged in 1919 with the Home company purchasing the property of the New York Telephone Co. in James-

On the job records prove that the Neale Model D Pull-type Cable Spinner speeds new work, keeps line charges low.
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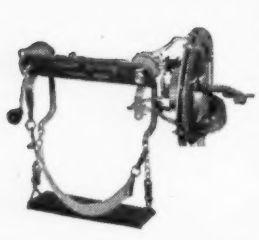
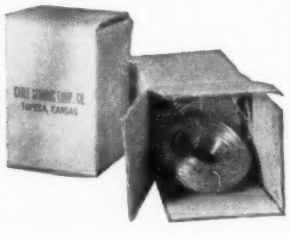


Neale Model B One Man Cable Spinner operates from ground or strand.



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town and vicinity. The company name was changed from the Home Telephone Co. to the Jamestown Telephone Corp. Mr. Wright became vice president and general manager of the new company and later was elected president.

Under Mr. Wright's direction the Jamestown company experienced a steady growth and is now among the larger and most successful Independent companies in the United States. After the merger of the Home and the Bell companies, the Jamestown company served around 8,000 stations, and today it serves 26,000 stations.

One of the outstanding accomplishments in Mr. Wright's long career was when he won an eight-year-old fight with the New York Telephone Co. over what was a fair division of toll revenue participated in by both companies. In 1932, the Jamestown company cancelled a toll compensation contract with the Bell company, holding that the revenues derived under the contract did not cover the Jamestown company's cost of handling its part of the toll service. The Jamestown company continued to collect and retain the portion of the tolls it collected which it considered a fair and reasonable compensation for handling the toll business.

After a five-year litigation in New York courts, as a result of a suit brought by the Bell company in 1935 to recover toll compensation, including interest, due it under the cancelled contract, which it said had not been legally cancelled, Mr. Wright won the argument.

In 1940 the New York Court of Appeals upheld lower state courts in ruling that the Jamestown company had legally terminated the contract and that there was no cause of action on the premise that the Bell company was relegated to its action upon a *quantum meruit* for services.

Mr. Wright's telephone interests were not confined to Jamestown as he had been for many years president of three Pennsylvania Independent companies—Meadville Telephone Co.; People's Telephone Co., Butler, and the Home Telephone Co., Ridgway. At the time of his death Mr. Wright was engaged in a million-dollar expansion of facilities for these companies.

Mr. Wright had extensive interests outside the telephone business. He was president of a Jamestown bank for several years and was a director at the time of his death. He also was interested in various local industries.

He was one of the founders of the Jamestown Automobile Club in 1909 and, at one time, was a director and president of the New York State Automobile Club as well as vice president and a director of the American Automobile Association.

Among his outstanding contributions to safety promotion was his membership in the national group which conceived the idea of schoolboy patrols, organizations which have grown to substantial proportions and are doing effective work in safeguarding children on their way to and from school.

In recent years, Mr. Wright had been deeply interested in aviation, purchasing his own plane at 73 and flying as many as 80,000 miles every year. He was instrumental in the development of Jamestown's Municipal Airport.

When the United States entered World War II, he promptly turned his energy into the war effort, making substantial contributions of time, money and experience to the development of air-power.

He was the leader in the organization of the Civil Air Patrol Unit in Jamestown in 1942, and was given the rank of major when that organization was made an auxiliary branch of the Army during the war, with command of the Seventh Group, New York Wing.

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He also served as personnel officer on the staff of Col. Stewart C. Welch, commander of the New York Wing.

Mr. Wright had a hobby which he pursued diligently for several years—taking colored moving pictures of American countrysides in many sections of the United States. While following this avocation he made three trips to Florida for the purpose of completing one film of that state. His movie of Yellowstone Park has been shown numerous times in New York.

Mr. Wright was an intimate friend for more than 30 years of Robert H. Jackson, Associate Justice of the United States Supreme Court and former attorney general in the cabinet of President Franklin D. Roosevelt. Justice Jackson is a native of Jamestown and Mr. Wright was one of the first prominent Jamestown business men to recognize the unusual ability of Mr. Jackson as a lawyer. Mr. Jackson had practiced his profession in Jamestown only a comparatively few years, when Mr. Wright retained him as attorney for the Jamestown Telephone Corp., and later the future jurist was elected to the company's board of directors. As its attorney Mr. Jackson represented the company in the protracted suit with the New York Telephone Co. involving the division of toll revenues and in other important matters.

Mr. Wright served as a member of the New York Governor's Budget Advisory Committee under both Gov. Herbert H. Lehman and Gov. Franklin D. Roosevelt, and was named state delegate by Governor Lehman to the National Conference on Taxation in 1936.

Surviving Mr. Wright are his widow, one son, Lloyd C., Columbus, Ohio, secretary-treasurer of the Ohio Independent Telephone Association, and one daughter, Mrs. Forrest Kane, Jamestown.

V V

OBITUARIES

Mrs. Sallie Street Morris, manager of the Morris Telephone Co., Roxboro, N. C., which operates exchanges at Roxboro, Hillsboro and Yanceyville, died on Feb. 19. She was the wife of the late John Dee Morris, who founded the company, and operated the firm for many years after his death a few years ago, continuing to be active in the company until about a year ago.

• • •

Laurence E. Morier, 60, vice president, Brown Wood Preserving Co., Louisville, Ky., died on Feb. 19, while attending the annual convention of the Public Utility Buyers Group of the National Association of Purchasing Agents, at Pittsburgh, Pa.

He was a member of American Wood Preservers' Association for many years, a member of the Independent Telephone Pioneer Association, and sold poles in the utilities field for 40 years.

Survivors are his widow, a son, Larry Morier, Jr., Dayton, Ohio; a daughter, Mrs. George J. Mehl, Philadelphia, Pa., and four grandchildren.

• • •

E. A. McKenna, 60, manager of the Nebraska Telephone Directory Co., a subsidiary of the Lincoln Telephone & Telegraph Co., died on Feb. 5 at Houston, Tex., where he had resided since last November.

He began his career with the National Telephone Directory Co. at Houston in 1928. When ill health overtook him he went back there on leave of absence.

Before going to Lincoln in 1932, he had been manager at Little Rock, Ark., for the National company. He was a member of the Frank H. Woods Chapter of the Independent Telephone Pioneer Association.

• • •

Wallace L. Agee, 65, former district manager of the Central Iowa Telephone Co., and Independent pioneer, died recently at his home in Marengo, Iowa.

Mr. Agee was born Mar. 23, 1885, at Dalton, Mo. He spent his childhood at Keytesville, Mo. He was graduated from Keytesville High School and for a time attended William Jewell College.

During most of his adult years Mr. Agee was engaged in some phase of the telephone business. He and his brother, Ben, had owned the exchanges at Orange City and Wilton Junction, Iowa, prior to buying the exchange in Marengo and moving there with their families in 1925.

Three years later they sold their plant in Marengo to the old Associated Utilities Corp. and Mr. Agee became general manager of that company's telephone properties in Iowa. Later, those properties were purchased by the Central Iowa Telephone Co. Mr. Agee remained as manager of the exchanges until several months ago when he retired because of ill health. Included in the group of exchanges under Mr. Agee's direction were Marengo, Manchester, Hazelton, Fairbank, Delhi, Glidden, Pisgah, Little Sioux and Mondamin.

For 18 years Mr. Agee was a member of the Marengo school board, serv-

Ray Blain, TELEPHONY's technical editor, wrote in his Plant Man's note book, TELEPHONY May 21 issue: "The maintenance of accurate service records of individual drop wire installations in the average exchange proves a most difficult task.

This difficulty has been largely overcome by the design of DATED DROP WIRE that is now being sold by at least one manufacturer.

In our opinion, this arrangement represents real progress in the simplification of accurate plant records."

You can eliminate forever costly record keeping. This revolutionary method of DATING DROP WIRE is a daring challenge to all quality claims and is your assurance of the manufacturer's confidence and willingness to have you check his product against all competition.

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Over 50 years of quality manufacturing experience

ing as president of this board for several years.

Among those who survive Mr. Agee are his widow; four sons, Carl of Cedar Rapids, Iowa; Wallace B. of Des Moines; Benjamin W. of Iowa City and Charlie W. of Marengo; one sister, Mrs. Ella Harden of Denver, Colo., and a niece, Mrs. Ella Agee Cronbaugh of Belle Plaine, Iowa.

V V

Oregon Telephone Co-op Plans REA Loan

Members of the Pioneer Telephone Co-operative held their first annual meeting the first part of February at Philomath, Ore. The co-op holds an option on the Coast Telephone Co., operating in Philomath, Alsea, Waldport and Yachats, and intends to combine that system with the Blachly-Deadwood Telephone Co., Blachly, Ore., and the Little Elk Telephone Co., Eddyville, Ore.

Application has been made for an REA loan to finance the mergers and to extend service into a number of areas in Lane, Lincoln and Benton counties now without telephone service. Directors of the co-op plan to connect approximately 2,000 subscribers in the next 10 years.

At the annual meeting, Donald Stokes, Harlan, was re-elected president of the organization; H. E. O'Flyng, Blachly, was re-elected vice president, and H. R. Glasscock, Eddyville, was returned to the office of secretary. Gordon Larson, Philomath, was elected treasurer.

V V

Plan Large Co-operative In Arizona, New Mexico

Representatives of 33 northeastern Arizona and southwestern New Mexico communities recently met in Show Low, Ariz., to complete plans for forming a cooperative telephone system.

Prospective members of the group with Nelson S. Wirick, Snowflake, chairman of the cooperative, attended the meeting with officials of the Rural Electrification Administration.

A network to give 24-hour dial service is planned.

V V

Burt Ruffner to Owosso, Mich.

Burt Ruffner, formerly general plant superintendent of the Kentucky Telephone Corp., Lexington, Ky., recently joined the Union Telephone Co., Owosso, Mich., as plant superintendent.

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Strain Plates • Storm Guy Straps • Lags
Machine and Hubeye Bolts
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Anchor Rods • Grounding Wire Clamps
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A STRAIGHTFORWARD REGULATION PHILOSOPHY

Some straightforward and refreshing talk on the philosophy of utility regulation was given to a group of Michigan public officials recently by Schuyler L. Marshall, member of the Michigan Public Service Commission, in an address before the Michigan Association of County Supervisors.

With six years' experience on the Michigan commission and many years as editor and publisher of a successful weekly newspaper, Mr. Marshall emphasized that utilities must be profitable to provide good service, that big business is big because people demand their service, and that inflation is an evil that puts a particular squeeze on utilities.

Following are excerpts of Mr. Marshall's address which should be of particular interest to the telephone industry:

* * * *

"I favor a fair profit for utilities. It is in the public interest.

"I am NOT against big business. Big business is big because the public makes it big—by demanding its product.

"I believe inflation is the greatest threat to America today. I fear inflation because it distorts value by changing the *yardstick of value—the American dollar.* Inflation confuses and alarms the public. Inflation is the convenient tool of irresponsible demagogues. It is an *insidious and dishonest method of repudiating debt.*

"I have been a member of the Michigan Public Service Commission for six years. I recognize as never before the fundamental services of utilities—*electric power, gas fuel, telephonic communication* and *rapid transportation*—to be foundation stones of our state and national economy. These services affect the economic life of every family, every commercial and industrial concern.

"In the past six years I have observed that nothing can have such a disastrous and adverse effect on the economy of a given area as a poorly managed, improperly financed utility. I have in mind several Michigan situations which the Michigan commission has dealt with.

"Utilities are not immune from the effects of inflation. Utilities have been hit by the same economic cross-currents which have made the 1940 $5,000-home cost $10,000 of today's 57-cent dollars. This same inflationary influence has made the 35-cent haircut cost $1.00; the $1,000 small car cost $2,000; the $35 suit of clothes cost $65 to $85, etc.

"There are three general classes of people who are directly concerned with the rates of utilities:

"(1) The consumer who pays the rates. In terms of hours worked, bushels of wheat, pounds of beef or pork—or almost any other commodity—utility services are today, the biggest bargain on the market.

"(2) The utility workers whose wages are dependent upon the utilities income. Utility wages have been increased apace the cost of living and are comparable to those paid in other industries.

"(3) The investing public whose savings-dollars are loaned to pay for utility plants in service. Dividends to the common stockholders continue to be held to 6 per cent to 7 per cent—without regard to the decreased purchasing power of the dollar. . . .

"On the one hand, the Michigan Public Service Commission is designed to protect the public from exorbitant rates and to define and regulate conditions of service to the public. On the other hand, it is charged with the responsibility of allowing utilities to earn a fair return on the fair value of their property—enough to enable them to give good service and enough to enable them to attract capital for expansion."

153 Telephone Companies

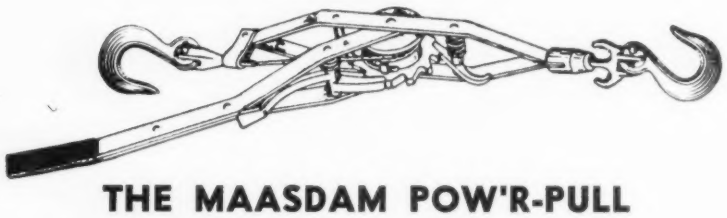
Investment	$450 million
Revenues	$138 million

"The people of Michigan have demanded and are presently using two million telephones—about one telephone for each three people. The Michigan Bell Telephone Co. presently has 1,841,000 telephones—more than 90 per cent of the state's total. The balance, or the remaining less than 10 per cent, of Michigan telephones is divided up among 152 small telephone companies.

"Among the utilities, the telephone business is the most hazardous. By its nature it requires a much larger per cent of personnel than any other utility and its expenses are affected in a greater degree by increased wages than any other utility. Contrasted with the electric industry, the telephone companies are much more vulnerable to fluctuating economic conditions.

"*Since 1940, the number of telephones*

"THE HANDIEST PULLER I EVER HAD" USER REPORTS



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in Michigan has doubled—this has been a period of inflation and free spending. Past experience shows that in a period of depression, as compared to other utilities, telephone companies lose a larger percentage of their subscribers, and they are left with the same capital investment—the same plant that they built to take care of a maximum number. The Michigan Bell Telephone Co. has built $175,000,000 of buildings, switchboards, lines and cable and other facilities since V-J day in 1945.

"As contrasted with gas and electric industry, the telephone industry requires *no capital investment from its subscribers*, while to install either gas or electric service the average home owner must invest in appliances and wiring which may cost as little as $250 or as much as $1,000. Obviously, in times of depression, electric and gas facilities are continued in the average home while the telephone may be the first to be discontinued . . .

"Did you know that the Michigan Public Service Commission is the '*Security and Exchange Commission*' having jurisdiction over all utility financing? Since V-J day the utilities of Michigan have added new plant and have issued new securities amounting to more than $500,000,000 . . .

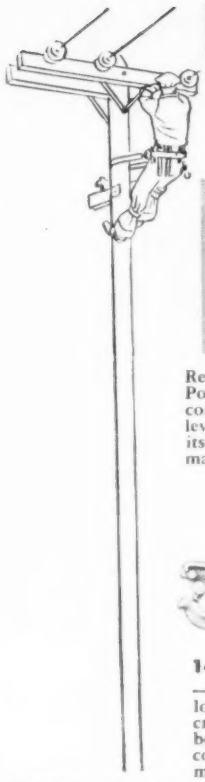
"It seems to be a popular belief among many people that utilities are owned by wealthy individuals. This is far from the truth. Probably 90 per cent of the men in this room own utility stock indirectly and don't know it. Surely you own utility stock, if you have any life or fire insurance, because the life and fire insurance companies are the largest buyers of utility securities. Investment bankers invest the money of their depositors in utility securities — as does your home town banker to a limited degree . . ."

Louisiana Association

(Continued from page 27)

Pointing out that there are currently about 10 million fewer telephones in the United States than radios, he predicted that this will soon change, and that there will be more telephones than radios.

"Money, materials and manpower are the vital concerns of telephone management," Mr. Corman continued. Regardless of what is ahead, a peace-time or war economy, he advised telephone management that "we must not compromise with what we must do." He



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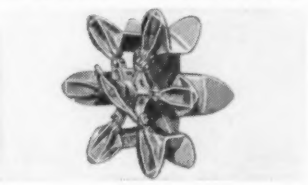

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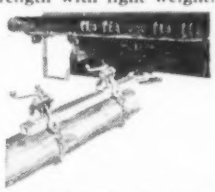

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These A. B. Chance Co. salesmen and plant executives convened at the Chance company plant in Centralia, Mo., Jan. 8 to plan the company's activities for 1951. Sales department heads and executives on the front row are, left to right: O. G. ANDERSON, special representative; LESTER CRANE, manager of sales, hot line tools, switches and protective devices; N. A. TOALSON, vice president; L. C. HANSEN, general sales manager; J. T. ISBELL, vice president in charge of sales; F. G. CHANCE, president; E. K. COLA, retired anchor specialist; H. A. HOUSTON, advertising manager; R. W. KUNKLE, newly appointed managing engineer, formerly manager of sales, anchors and pole line specialties.

advised that under no circumstances should telephone management halt borrowing, building, expanding, growing to its job.

He cited the importance in telephone management of good relationships of Independent telephone companies with each other, with the Bell System, with public service commissions, with government and politics, with employes and, most important, with subscribers. "To be and remain satisfactory there must be in the company an ingrained, inherent, true desire to give service."

Mr. Corman cited that the attitude of management is extremely important. "We must accept the responsibility that being a monopoly places upon us."

Progress made by the rural telephone loan program of the Rural Electrification Administration was detailed to the convention by D. B. Corman, Washington, D. C., consultant to REA Administrator Claude R. Wickard.

He pointed out that in the one-year life of the REA loan program there have been received 715 applications for loans from 42 states and 66 loan allocations have been made, involving $21,318,000.

Ben Hatfield, New Orleans, representative of Southern Bell Telephone & Telegraph Co., gave a demonstration on "Toll Line Dialing."

His talk, amply illustrated by diagrams, was aimed at interpretation of the goal of toll line dialing. He told

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the delegates that this system, already operative in about a third of the nation, means improved service at lower cost—a constant goal of telephone management.

Mr. Hatfield discussed at length the changes in equipment and procedure necessary to install this system nationally and urged Independent telephone management to call upon the Bell System for aid in extension of the system. "We are anxious to work with you and anxious for you to work with us."

Two programmed speakers were unable to attend the convention because of previous commitments and the weather conditions. They were Lieut. Gov. William J. Dodd of Louisiana, and Harvey Broyles, Shreveport, member of the Louisiana Public Service Commission. J. M. Bennett, deputy civil defense administrator to Lieutenant Governor Dodd, spoke at the banquet meeting. He spoke of the important role telephone companies and their personnel play in the state's civil defense program.

John A. Brady, Sr., Golden Meadow, La., president of the Lafourche Telephone Co., Inc., and president of the Louisiana association, presided at the convention.

The board of directors for the new year will consist of Mr. Brady, J. M. Nelson, Welsh; Ed Schultz, Springhill; A. M. Cobb, Jena; Earl Conrad, Breaux Bridge; W. T. Henning, Sulphur; Hooper P. Carter, New Orleans; W. J. Camp, Sr., Cottonport, and Clark Williams, Oak Ridge.

New officers are to be named by the board of directors later.

V V

Henninger Succeeds Wright as Head of Butler, Pa., Company

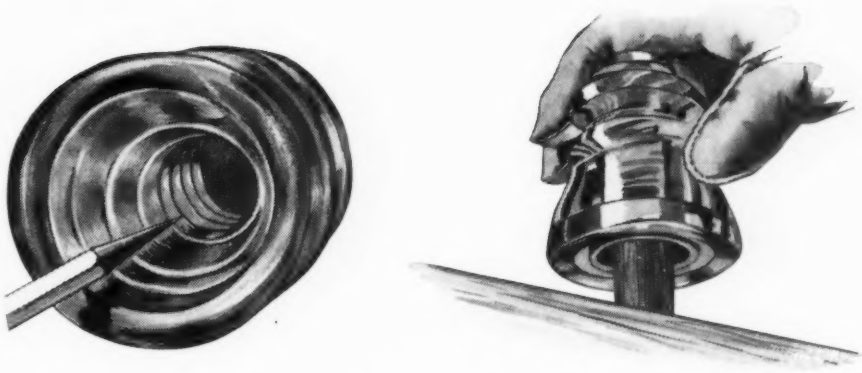
Zeno F. Henninger, prominent Butler, Pa., attorney and stockholder of The Peoples Telephone Corp., Butler, was elected president of the corporation on Feb. 22 to fill the unexpired term of the late John H. Wright, who passed away on Feb. 16.

Mr. Henninger has been a member of the board of directors of the Peoples company since 1946.

V V

New NPA Answer Book Issued

A National Production Authority booklet, "Inventory Control and Priorities," with answers to 85 questions, is now available from the authority in Washington, D. C. Mentioned in the pamphlet are the locations of over 50 field offices where any questions not taken up in the printed matter may be directed.



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Three Indiana Co-ops Merge; Plan REA Loan

Merger of three rural telephone cooperatives operating in Spencer and Perry counties, Indiana, was voted on Feb. 15 at a meeting of representatives of the three groups meeting in Tell City.

The co-ops are the St. Marks, Lamar and St. Meinrad telephone cooperatives.

The Rev. Eugene Weidman, St. Marks, was named coordinator and plans were made to file an application for a loan from REA to rehabilitate the old system and build new additional lines to improve service.

Plans are to include all farmer-owned lines that wish to join the program. Deadline for applications to join the merged group was set for Mar. 1.

V V

D. L. Harrington Heads Donnelley Executive Committee

D. L. Harrington, vice president of the Reuben H. Donnelley Corp., Chicago, was elected president and chairman of the executive committee of the company on Feb. 20, the board of directors announced.

Mr. Harrington, who will make his headquarters in Chicago, succeeds Raymond M. Gunnison of New York who became board chairman. Elected as board vice chairman was Gaylord Donnelley, an executive vice president of the company.

D. L. HARRINGTON

Mr. Harrington joined the company in 1922 when it purchased a mailing list firm in Nevada, Iowa, of which he was a partner. First as production manager of the Donnelley direct mail division and later as general manager, he built the division into one of the largest organizations of its kind in the world.

In 1943 he became vice president and

TELEPHONE PRINTING
By People Who Know the Telephone Business
SEE THE SUTTLE CATALOG
SUTTLE EQUIPMENT CO.
LAWRENCEVILLE ILLINOIS

THE AMERICAN APPRAISAL COMPANY
INVESTIGATIONS • VALUATIONS
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CHICAGO • MILWAUKEE • NEW YORK
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SPECIALIZED COLLECTION SERVICE
for telephone companies (Since 1926)
on delinquent and charged off accounts
No Advance Fee Required
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Lewis Tower, Phila. 2, Pa. Telo. PE 5-4736

SPECIALISTS O Our 45th Year
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PRINTING • PLANOGRAPHING
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CONSULTING ENGINEERS
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Appraisals—Original Cost Studies
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ATLANTIC
Creosoting Co., Inc., 17 Battery Pl., N. Y. C.
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PLANTS AND OFFICES
New Orleans, La. Jackson, Tenn. Boston, Mass.
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CREOSOTED SOUTHERN YELLOW PINE
LOW RESIDUE COAL TAR DISTILLATE
"Truck Delivery Our Specialty"
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Rectichargers; Battery eliminators
Subcycle—Telering
Calculagraphs
Main Distributing Frames
Protector groups, W.E., Sands, Reliable, Cook
Substation Protectors, W.E. 98A, etc.
5 pair open line arrester, Cook #7
TERMINALS, pole, mdf, cable
Cook XB 11, Reliable RU 11
W.E. B boxes, B-101, B-26
Cook Uniflex 51 pair
WIRE, Drop & Bridle #14, #17, #18 ga.
Interior, #19/2, #22/2, #22/3
CABLE, 5 pr. #19 ga., Neoprene; Latox
2 pr. lead, #19 ga., direct burial, double-steel tape armor, jute protected.
3 pr. #22 ga., rubber filled tape, aluminum-alloy basketweave armor.
15 pr. #22 ga. enameled, coded, silk & cotton, rubber filled tape, galvanized basketweave armor (suitable for aerial or underground).
STRAND, guy or messenger, ¼" to ½".
POLE LINE MATERIAL, crossarm braces, guy clamps, clips, suspension clamps, grade clamps, thru bolts, double arming, angle eyes, straight eyes, strain plates, washers, square, curved, machine bolts, lag screws, trans. brackets, etc., ground & anchor rods.
INSULATORS, #9 pony, ceramic; Lag screw type, 2 groove.
Cable splicers trailers, Bell System type.
Test Sets; Wire Chiefs; linemans; Exploring coils.
Linemans wrenches.
Cord Tipping tools, W.E. #444A.
Switchboard cords, plugs, jacks, relays, keys.
Repeating Coils, Kick Coils, induction coils, retard coils.
Bells, horns, howlers, 20 cycle; 60 cycle, 110 volt.
Telephones, CB, LB, desk & wall types; weatherproof & mine types.

In addition to the above, we have thousands of other telephone items, both new and used, in too small a quantity to advertise.

Write us concerning your needs, stating type and quantity desired and we will quote prices, furnish additional information, photos, samples as desired.

Shipped on 30 day open account subject to your approval.

THE Telectric CO.
1718 VENICE BOULEVARD
LOS ANGELES 6, CALIF.
Richmond 2249

at that time became active in the management of the company's classified telephone directory operations.

Donnelley's directory division handles telephone book advertising for Illinois Bell Telephone Co., New York Telephone Co., The Bell Telephone Co. of Pennsylvania, the Chesapeake & Potomac Telephone Co., and The Cincinnati and Suburban Telephone Co.

It maintains offices for its other divisions in Chicago, New York, Boston, Philadelphia, Los Angeles, and Nevada, Iowa. The company also publishes a number of trade magazines in New York.

V V

C. & L.'s New LP-Gas Heat Tools Now on Market

The addition of LP-Gas fire pots, tinners furnaces and torches to the Clayton & Lambert Mfg. Co.'s line of heat tools has been announced by Rowland J. Miller, vice president in charge of sales.

The new C&L LP-Gas fire pot is versatile in its operations through use of adaptors available as accessories, the company said. It can be operated on top of a 20-pound cylinder; as a bench unit off a gas cylinder, or the lead melting assembly may be used with any commercial LP cylinder now in use. The standard LP cylinder furnished with the assembly can be refilled by any LPG dealer or distributor.

The new LP-Gas tinner's furnace may be equipped with a two-pound cylinder, but will operate from any size propane cylinder. It was claimed that the furnace lights without preheating and instantly produces a clean blue flame of intense heat.

The LP-Gas hand torch also features instant ignition and, through the use of inter-changeable heads, it is understood the LPG model will handle any size job where torches are required.

The Clayton & Lambert Mfg. Co., with plants in Louisville, Ky., and Middletown, O., in addition to heat tools, manufactures Lamneck furnace pipe and fittings, Silver Shield silos and grain bins, Monarch panic exit devices and Hoffman water heaters.

Need help? Need a job? Something to sell? Something to buy? For best results and quick results use

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Powerful--Dependable
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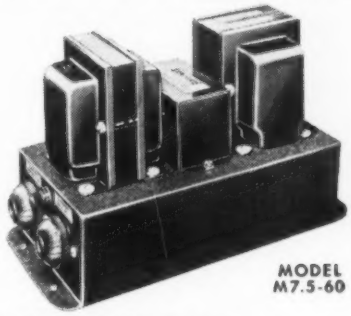

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- Built for Heavy Duty

MADE IN SEVERAL POPULAR MODELS

BC-30X	3½ W.	P. B. X.
BC-20X	3½ W.	P. B. X.
M-7.5	7½ W.	Small Swbd.
S-60	20 W.	Standard
BX-60	15W.	Standard
CC-60	45W.	Heavy Duty

For Details See Bulletins 155 and 159

K-5 SUB-CYCLE FOR "DECIMONIC" RINGING

5 Frequencies: 20—30—40—50 and 60 Cycles. For Details See Bulletin 157.

The Biased Core, SELF-STARTING SUB-CYCLE Will Be Available After March 1950. Arranged for Either 19" or 23" Relay Rack Mounting.

BC-20M	7.5W.	Small Swbd.
BC-20S	20W.	Standard
BC-20C	45 W.	Heavy Duty

Sold Through Leading Telephone Distributors

LORAIN PRODUCTS CORPORATION
DEPT. P, 1122 F ST., LORAIN, O.

FLOTROL — PARTNERS IN DEPENDABILITY — SUB-CYCLE

CLASSIFIED SECTION

Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less.

FOR SALE

120-STATION MAGNETO EXCHANGE. Completely modern six-room home, with full basement. Includes line truck, tools and material. Plenty of room for expansion. Excellent toll business. Priced reasonably for cash or terms. Reason for selling: other business interest. Write Victor Rhine, Stella, Mo.

212 STATION COMMON BATTERY EXCHANGE with office, warehouse and residence. County seat town, good schools. Plant in good condition. Write: Box No. 3008, c/o TELEPHONY.

Magneto exchange in Southwest Missouri. 150 subscribers. In fruit and dairy center. Gross revenue 1950—$3,816.50. Write: Gerald Preddy, Exeter, Mo.

83 PRACTICALLY NEW NO. 11 LEICH BATTERY FEED COILS $2.50 EA. 9—1435U PROTECTOR GROUPS $10.00 EA. HOME TELEPHONE CO., MONCKS CORNER, S. C.

MAGNETO TELEPHONE EXCHANGE 15 miles from Wichita, Kansas; expanding small town, prosperous farming area. Excellent toll business; 130 telephones, 21 business. Newly installed central office equipment. Priced less than twice yearly gross revenue of $3,800. Write: Herald Osburn, Bentley, Kans.

FOR SALE

A. E. type 38 Handsets rebuilt like new with new 3 cond. cords ..... $3.95 Ea.
New Stromberg-Carlson Switchboard Lamps 30 volt ..... $10.00 per 100.
New Kellogg 40 volt Switchboard Lamps ..... $10.00 per 100.
Handsets like NEW for EE8 field telephones ..... $3.75 Ea.
Terms: Check with Order FOB Brooklyn, N. Y.

EASTERN TELEPHONE COMPANY
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RECONDITIONED EQUIPMENT

Kellogg No. 22 Transmitters, rebuilt and refinished, with refinished back and new mouthpiece $1.45
Desk Stands—Kellogg—completely rebuilt and refinished, with new cords, mouthpiece, transmitter and receiver—$4.00 ea.—or $3.50 ea. in lots of 10 or more.
New W.E. Swbd. Plugs with new 6 ft. 2 cond. cord ..... $1.20 ea.
Rebuilt Kellogg 1000 ohm ringers, complete with gongs and mounting screws..... $1.50 ea.
Slip type receivers with refinished shell and new cord $1.25
Rebuilt W.E. Bipolar receivers, complete....$1.25
Modern Kellogg Bakelite front transmitters, No. 117 capsule type, to fit old style back....$1.50
New W.E., S.C., or Kellogg mouthpieces....$.10
New slip type receiver shell and cap.....$.50 set
W.E. 3 bar 2500 ohm magneto ringer boxes, like new $6.50
New LENZ moisture proof cords for all phones and switchboards at money saving prices. Standard sizes shipped from stock. Prompt delivery on specials.

TRANSMITTER REBUILDING

Your Kellogg, W.E., S.C. or Leich transmitter rebuilt to exacting standards with new micas, new granular carbon, and complete refinishing at ..... $.75 ea.
We also stock many other items, both new and rebuilt, of interest to the Independent. Among these are Nicropress products, Cook products, Bantam phones, wall handsets batteries, linemen's supplies, etc. Your inquiries solicited.

REBUILT ELECTRIC EQUIPMENT CO.
1704 W. 21st Place Chicago 8, Ill.
Edw. C. Stoeffhaas, Jr., Mgr.

FOR SALE

500 Used Stromberg-Carlson No. 1155 Steel Wall Telephones....$3.50 ea.
500 Used Stromberg-Carlson No. 1156 Steel Desk Set Boxes....$2.50 ea.
Frequencies: Straight line, 16-2/3, 33-1/3, 50, 66-2/3 cycles.
Write Box No. 2973, c/o TELEPHONY

USED TELEPHONES
Cleaned and Tested

W.E. Magneto 5-bar Bell Boxes..... $8.50
W.E. Magneto 3-bar Bell Boxes..... $6.50
W.E. Magneto 5-bar Wall Telephones..... $8.50
A.E. Oval Base French Telephones, No. 1A blank for dial, complete with cords..... $8.50

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GERMANTOWN NEW YORK

E. A. HOSMER & CO.
COMMUNICATION ENGINEERING
KENWOOD, CALIF.
Large quantity Magneto wall sets various types, just removed from service. As is, or will rebuild. Reasonable.

PORTABLE
Power Driven Switchboard Plug Polisher
FOR TELEGRAPH — TELEPHONE — RADIO
FAST—EFFICIENT—DEPENDABLE
SOMETHING NEW IS BEING ADDED TO MAKE PLUG POLISHING A PLEASURE
NOW BEING USED EXTENSIVELY BY LARGE RAILROAD, TELEPHONE & TELEGRAPH COMPANIES.
Write for complete data, prices, etc.
(Patents pending)

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RECONDITIONED
BATTERY CHARGERS

W.E. CO. KS-5364 FULL WAVE TUBE TYPE INPUT—105/125, 190/250 VOLTS, 50 TO 60 CYCLE A.C. OUTPUT 17 TO 80 VOLTS D.C. 1 TO 12 AMPS.

CHOKE OR REACTANCE COILS, FUSE PANELS AND RESISTANCE LAMP STRIPS FOR ABOVE.

POWER UNITS

W.E. CO. KS-5925-L01. INPUT 105/125 VOLTS, 50 TO 60 CYCLE A.C. OUTPUT 120 VOLTS D.C. .02 AMPS.

IMMEDIATE SHIPMENT
ASK FOR CIRCULAR 1150-B

BUCKEYE TELEPHONE and SUPPLY CO.
COLUMBUS 6, OHIO

We own and have in stock new and unused 2,000 units. FTR 801-BB convertible

MAGNETO TELEPHONES

including battery boxes and one set of spare parts to each 10 phones. Telephones are made by the Federal Telephone and Radio Corp. Generator new type FTR 701 A. Ringer Western Electric Co. type BIAL DC resistance of 4600 Ohms 9 Henrys at 900 cycles. Handset Western Electric type FIAW 3. with extension cord W-E No. 44A. Packed for export. 8 phones to a case.

Catalogue and prices on request.

KENIG ELECTRONIC AND WIRE CORP.
55 W. 42 St., New York 18, N. Y.
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LOOK FOR THE NAME "COPPERWELD" — IT PROTECTS YOU!

YOU NEVER KNOW WHERE, WHEN, OR HOW OFTEN LIGHTNING WILL STRIKE . . . but you can secure safe, permanent and economical grounding protection when you install Copperweld* Ground Rods and Clamps. For every grounding application requiring the use of driven electrodes, these superior ground rods offer you these important advantages:

1. *Molten-Weld*—Permanent interlocking weld between the copper and alloy steel eliminates possibility of electrolytic action. No other ground rod has this inseparable union, accomplished only by the proved Copperweld Molten-Welding process.
2. *Ease of Installation* — Copperweld's extra-strong alloy steel core assures rigidity and easy driving even through very hard soils.
3. *High Conductivity*—Copperweld's thick sheath of pure copper provides excellent electrical conductance. Copper-to-copper contacts throughout insure low resistance.
4. *Protection Against Rust* — Copperweld's heavy copper armor permanently protects the alloy steel core against corrosion.
5. *Greater Economy* — Longer service life with no maintenance costs.

Start now to reduce outages and insure continuity of service by using Copperweld Ground Rods and Clamps. They provide safe, permanent, low-cost grounding protection at all types of locations—at poles, at towers, at power stations, at substations, at buildings — and for all grounding purposes.

MADE BY COPPERWELD STEEL COMPANY GLASSPORT, PA.

*Trade Mark

COSTS YOU LESS — Copperweld — BECAUSE IT LASTS LONGER

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